BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 30 1940

SURGICAL EXPERIENCES WITH THE B.E.F.

BY

C. MAX PAGE, D.S.O., F.R.C.S.

Colonel, late R.A.M.C.

The rapid movements and quick change in events in France and Flanders during May and June of this year imposed a strain on the medical organization comparable to that to which the combatant section and other services were submitted. A detailed consideration of the established medical arrangements and the means whereby these were adapted to the occasion is outside the scope of this communication. At the outset the disposition of medical units and personnel was essentially the same as that which was operative at the end of the last war. Additions were the provision of more mobile surgical teams for service in the casualty clearing area and the establishment of the Blood Transfusion Service.

The first phase of active operations was associated with such speed of movement that many wounded, with the necessary R.A.M.C. personnel and much material, had to be left behind. I would say, however, that in the second stage of operations all wounded who were evacuated to units south of the Somme were safely transported to England.

Bearing in mind this background to the active period of the war in France—the only time when battle casualties were handled in quantity—it can be understood that systematic work on new methods was seldom possible and records of results were imperfect or incomplete. As a result only personal impressions can be put forward in support of any views expressed here. The impressions received at the time have to some degree been confirmed or corrected by subsequent conversations on the subject with medical officers receiving casualties in this country. The outline which follows represents an attempt to piece together our aims and achievements in handling the wounded man, and defines those aspects of the subject which appear to call for further trial and study.

Wound Prophylaxis

In the treatment of any wound the aim of the surgeon is to repair mechanical damage so far as he can, but his most important task when dealing with missile injuries is to prevent or check progressive bacterial infection. The first step in this direction can be taken before the man is wounded, by immunizing him against the more dangerous infections. Under this heading comes protection against tetanus. Practically every man in the B.E.F. received two inoculations of toxoid given at the same time as he received T.A.B. Every wounded man received a single dose of 3,000 units of A.T.S. Whether due to these measures or not, the incidence of tetanus proved to be very low. The final figures are not yet available, but I know of only four cases occurring in France, two of which were fatal. Anti-gas-gangrene serum (polyvalent) was available in quantity, but was not systematically employed as a prophylactic.

Chemical Agents.—The other prophylactic measure, of which great things were hoped, was the use of sulphanilamide. This was given sometimes by the mouth shortly after the man had been wounded, and in other cases as a wound pack. The dosage when given by the mouth for prophylactic purposes was generally a primary dose of 2 grammes followed up with 1 gramme four-hourly, to the total amount of some 15 or 20 grammes. In the wound pack initiated by the work of Jenson *et al.* (1939) a total of from 5 to 20 grammes was put into the wound and kept in place by suture or a protective dressing. I do not think it is possible to give a final opinion of the results of this form of treatment. It had been hoped to check its value by controls, but events prevented this systematic study. The general impression is that both streptococcal and anaerobic infections were less in evidence in wounds than had been expected, and this fact has generally been attributed to the use of the sulphonamide group of drugs.

Surgical Treatment

The aim of the forward area organization was to bring the wounded man within the sphere of surgical aid within twelve hours of his being hit. It is generally accepted that from 20 to 40% of lying cases and about 5% of the walking wounded should be operated on within this period if the best results are to be obtained. In the event it was only in a few units and for limited periods that so short a time lag was operative. Before operation the importance of the treatment of primary and secondary wound shock was fully recognized, and resuscitation teams, generally organized by an officer of the Blood Transfusion Service, were established both in casualty clearing stations and in base hospitals. Warmth, rest, and morphine had their place, but undoubtedly the provision and transfusion of stored blood were of key value. The general principle of wound excision (*épluchage* of French surgeons) determined the scope of the primary operation apart from the repair of any special viscus. The procedure was carried out whenever possible if the patient was received within from twelve to twenty-four hours of injury. The excision should not involve the removal of much skin, but free incision is necessary to carry out the process effectively. Excision of devitalized fascia and muscle is of chief importance. In regard to primary suture after such operations, the general experience in France was against the practice. It is true that in a group of cases treated in the Metz area a measure of success was achieved; but in other instances

deep suppuration developed, adding greatly to the dangers and length of convalescence.

Under war conditions great importance attaches to the selection of the cases in which early wound excision is most urgent. In general all wounds of entry only, and therefore with a retained missile, come into this category: in the buttock, thigh, calf, or shoulder area these are particularly apt to develop serious anaerobic infection. In practice very small uncomplicated wounds of this type were not so treated, and in the case of multiple wounds only the larger ones were explored or excised. The complications of a fracture or joint injury are also indications for surgery. On the other hand, through-and-through wounds due to rifle or machine-gun bullets are recognized as relatively benign from the point of view of infection. It was noted in France that this was the case, and such wounds were seldom excised if uncomplicated by serious haemorrhage or the perforation of a hollow organ.

In the event of a man not coming under surgical care for two or three days after being wounded, formal wound excision is out of place. It is in these circumstances that serious anaerobic infection, either local or progressive, was most often seen, to a degree recognized as gas gangrene. The number of more serious infections of this character observed was small, certainly less than was seen under corresponding conditions of evacuation in the last war. The treatment employed was to lay the wound freely open, remove the missile if possible, and excise necrotic muscle. Amputation was resorted to only in the more serious cases of gas infection.

The after-treatment both of wounds excised early and of wounds laid open on account of infection was to pack them with gauze sometimes soaked in vaseline. When sulphanilamide was put into the wound the gauze pack was not employed. A course of sulphanilamide was also sometimes given by the mouth to both groups of cases. The general practice was to avoid the redressing of wounds for four or five days unless the clinical signs suggested some progressive infection or the presence of secondary haemorrhage or gangrene. The closed plaster cast was not systematically used for wounds uncomplicated by fracture.

Fractures

Femur.—Transportation of fractures from the field to the C.C.S. was carried out on the accepted lines; from the C.C.S. to the base fractures of the femur were put in Thomas splints, the traction often being applied through a transfixion pin in the heel. Under stress a certain number were sent down with a hitch over the ankle; this method almost always produced a pressure sore if the boot and sock had been removed, and should not be employed. Adhesive traction was little used, although there is a good deal to be said for it under the conditions in question.

In the base hospitals fractures of the femur were still kept in Thomas splints and the fragments aligned with the aid of skeletal traction. Before the war of movement had begun the Braun-Böhler frame was often employed for this injury, and in some cases traction without any splint. When rapid evacuation was necessary the shortcomings of these latter methods for active service conditions were noted, because for transportation it was desirable to transfer all such cases to Thomas splints or plaster if the fracture was to be immobilized properly for the journey.

Tibia and Fibula.—In the forward area rough immobilization was secured by the Thomas splint or by Cramer wire. From the C.C.S. onwards fractures involving the knee and those of the leg were in general fixed in whole plaster cases. This proved comfortable and efficient. The positional results were often so good that no change of plaster was necessary at the base, at any rate for two or three weeks. Some instances of the development of serious pressure under the case were observed; this complication was avoided if the cast was cut through in its whole length when it was likely that the patient would be moved within twenty-four hours of its application.

In a good many instances transfixion wires or pins were incorporated with the plaster. Though there is a risk in the use of this method in the presence of an open fracture I cannot say I saw more than one serious example. Some surgeons used the Thomas splint for the transport stage in fractures of the leg. I am satisfied that plaster gives much better immobilization and greater ease to the patient.

Upper Extremity.—Fractures in the upper third of the humerus were moved in the forward area, the arm, with an axillary pad, being bound to the side. Fractures in the lower section of the bone and fractures of the elbow-joint and forearm were roughly immobilized with Cramer wire splinting. From the C.C.S. to the base the fractures in the upper third were often treated as above, and the fractures of the lower part of the humerus and of the forearm were immobilized in a plaster case or in plaster slats. If the patient is to be moved soon after application of the case provision for expansion is just as important in this area as in the lower extremity.

It will be observed that the Trueta or Winnett Orr method of using the closed plaster case was generally applied in the treatment of many fractures of both extremities with satisfactory results. Its use for simple flesh wounds was exceptional, although the value of the principle of infrequent wound dressing, inherent in the method, was recognized and conformed with.

Fractures of the spine due to missiles were moved from the forward zone in the dorsal position on stretchers, and of the few cases seen at the base most arrived without any special splint being applied.

Abdominal, Head, and Chest Wounds

Little opportunity occurred in France in May and June for the practice of the more deliberate type of surgery applied to abdominal, head, and chest wounds. Certainly no advance was made on the experiences of the last war. The following notes give a view of the policy which was adopted.

Abdomen.—It was recognized that early operation was the only means of saving life when hollow viscera had been damaged, and that it was often necessary for intra-abdominal haemorrhage apart from intestinal perforation. Operations of this character take time and call for reasonable conveniences. In consequence the number of cases operated on in France was small. It was not possible to estimate the recovery rate.

Head.—Very little operating on cranial injuries was done in the forward area. The only operations performed were those for tangential injuries with little damage to the brain substance or where depressed fractures appeared to be present. The procedure adopted was limited to wound excision and the removal of loose or depressed fragments. So far as was practicable the scalp was closed without drainage.

Chest.—In open warfare gunshot wounds of the chest account for a large number of the fatalities, and the percentage of this kind of injury reaching the base hospitals was not high. Systematic early operation was not carried out. Cases of open pneumothorax were regarded

as urgent, and were sutured or stopped up, so far as possible. A few operations were done for primary haemorrhage either from the parietes of the chest or from the lung. In the cases arriving at the base aspiration was adopted for haemothorax, and closed drainage was carried out only when infection became clearly established. A few instances of pressure pneumothorax were treated by needling.

Conclusion

It must be admitted that any general experience of active surgery during the Battle of France was so limited by events that no definite conclusion in advance of our existing knowledge can be drawn from it. I would say that wound excision as a general principle still stands as the surgeon's sheet anchor. In sulphonamide and its derivatives we undoubtedly have allies of considerable power; we are not yet clear how far they should be regarded as adjuncts to surgical treatment or to what degree they may replace it. It is clearly desirable that controlled experiments should be planned in order to determine the value and the optimum dosage of the sulphonamide group of drugs, both in prophylaxis and in the treatment of missile injuries.

REFERENCE

Jenson, N. K., Johnsrud, L. W., and Nelson, M. C. (1939). *Surgery*, **6**, 1.

HAEMOLYTIC STREPTOCOCCI IN THE CARDIAC LESIONS OF ACUTE RHEUMATISM

BY

SCOTT THOMSON, M.D., D.P.H.

AND

JAMES INNES, M.B., Ch.B., M.R.C.P.Ed.

(From the Departments of Bacteriology and Pathology, University of Edinburgh)

The aetiology of acute rheumatism has not yet been exactly defined, and the ravages of this crippling disease justify an even greater amount of investigation into the problem than has been given.

The haemolytic streptococcus has been regarded as the causal agent because of the obvious relation of acute rheumatism to a preceding acute tonsillitis occurring usually about two weeks before the onset of the rheumatic syndrome. This antecedent tonsillitis is known to be caused by the haemolytic streptococcus, and most patients in the early stages of their attack of rheumatism still harbour large numbers of haemolytic streptococci in their throats even though they have recovered clinically from the throat infection (Coburn, 1931; Collis, 1931; Schlesinger, 1930; Green, 1938; McCulloch and Irvine-Jones, 1929). Haemolytic streptococci are, of course, found in large numbers in the throat for a few weeks after clinical cure of any uncomplicated attack of tonsillitis. Moreover, outbreaks of rheumatic fever amounting to minor epidemics have occurred in semi-closed communities where streptococcal tonsillitis has been epidemic (Bradley, 1932; Glover, 1930; Schlesinger, 1930; Grenet, 1920; Glover and Griffith, 1931).

Such findings, although only indirect evidence, cannot be overlooked in spite of the large number of failures to recover any specific organism from the heart lesions or from the joint fluids. For this reason a search has been made for a filterable virus, and claims that such a virus exists have been made by Schlesinger *et al.* (1935) and by Eagles *et al.* (1937).

Recently a more determined attempt has been made to recover a haemolytic streptococcus from the cardiac lesions of acute rheumatism even although the pathological appearances in the heart are not similar to streptococcal lesions in other tissues. A difficulty in such bacteriological investigations is that very few patients die in the acute stage. Green (1939) reported results in 9 such cases, and he was successful in all but one in cultivating haemolytic streptococci from those valves which showed vegetations, while no haemolytic streptococci were isolated from undamaged valves. Moreover, the streptococci isolated from different areas in any given case, including the throat strain, were of the same type (Griffith). The blood (post mortem) from such cases yielded no streptococci. Control cases never yielded haemolytic streptococci. Collis (1939) recovered haemolytic streptococci from 22 damaged valves collected from 17 cases of rheumatic fever.

Such evidence suggests an actual infection of the heart valves with haemolytic streptococci. We have continued this work, and the results of a series of 10 necropsies are reported.

Methods

The necropsies were performed as soon as possible after death, but in some cases twenty-four hours had elapsed and contaminants (nearly always coliform bacilli) were common in the material examined. After the thorax was opened the outer layer of pericardium was seared with a hot iron, and blood was removed from the cardiac chambers with a capillary pipette passed through the seared surface. The pericardium was opened through the seared area and some fluid removed for culture. Cultures were made also of any free pleural and peritoneal fluid. If there was a sero-fibrinous pericarditis pieces of fibrin were excised for culture. The surfaces of the liver and spleen were likewise seared and small pieces taken for culture.

The heart was then removed and opened as aseptically as possible after searing the surface. Cusps from the valves and a piece of myocardium were excised. In some of the cases these specimens were washed in alcohol before cultures were made. A throat swab was taken (post mortem), and on occasions the tonsils were removed for dissection and culture. In one case, in which the patient had died of chorea, the surface of the temporal lobe of the brain was seared and a little brain pulp aspirated with a pipette.

The culture medium used was the rich broth (from trypsin digest of horse muscle) described by O'Meara (1934), and subcultures were made after six hours, eighteen hours, and daily thereafter. Haemolytic streptococci grow most profusely in this medium in a few hours, and much of the success of the results was dependent on the fact that a subculture was made six hours after incubation. Frequently haemolytic streptococci were obtained in abundant growth by subculture or blood agar from the six-hour broth culture. Later subcultures from the original culture yielded only a few streptococci, which were difficult to isolate from contaminating bacteria. Case I, which is described to illustrate this, is a typical example of this observation, noted also by Green, who used the same technique (personal communication).

In 5 of the cases special methods were tried in an attempt to inhibit the growth of coliform bacilli. Heart valves and other tissues were cultured in broth containing sodium azide, and crystal-violet blood plates were used for subculture, but these methods did not yield as good results as that described above. Similar methods were adopted in 10 control cases.

Results

Ten fatal cases of acute rheumatism were examined post mortem and haemolytic streptococci were recovered from the hearts of 5. A very brief description of each case is given to correlate the clinical, pathological, and bacteriological findings. In the table which accompanies each case the use of a "positive" sign to indicate the presence of a lesion on a heart valve is restricted to acute lesions. In the case of lesions in the myocardium the "positive" sign is used to indicate the presence of Aschoff nodes without any attempt to indicate the exact age of such a lesion.

Case I

The patient, a boy aged 13, had had rheumatic fever in 1934. By 1938 there was an established mitral stenosis and aortic incompetence. He was admitted to hospital in 1939, and after a month died with advanced congestive heart failure. While in hospital the patient was afebrile.

At necropsy the pericardium showed signs of old pericarditis with a superimposed acute attack. Old rheumatic lesions were present on the mitral and aortic valves, with acute endocarditis on the mitral, aortic, and tricuspid valves.

Pathological Findings

	Naked Eye	Microscopical	Growth of Haemolytic Streptococci
Pericardium	+	+	−
Aortic valve	+	+	+
Mitral valve	+	+	+
Pulmonary valve	−	−	−
Tricuspid valve	+	+	+
Myocardium		+	+

Blood, spleen, liver, pericardial fluid, and pleural fluid did not yield a growth of haemolytic streptococci.

It is of interest to note that the subcultures from the six-hour broth culture of aortic, mitral, and tricuspid valves yielded haemolytic streptococci in very rich culture with only a few colonies of coliform bacilli. The plating from the aortic valve after eighteen hours yielded two colonies of haemolytic streptococci and an abundant growth of coliform bacilli; the mitral and tricuspid valves yielded only one colony of haemolytic streptococci and similar contaminants.

Case II

This patient, aged 13, developed typical rheumatic fever with chorea one week after tonsillitis. Severe febrile reaction persisted till death occurred one month later.

At the post-mortem examination the mitral and aortic valves showed an acute rheumatic endocarditis. The pulmonary and tricuspid valves and pericardium were healthy.

Pathological Findings

	Naked Eye	Microscopical	Growth of Haemolytic Streptococci
Pericardium	−	−	−
Aortic valve	+	+	+ (Type I)
Mitral valve	+	+	+ (Type I)
Pulmonary valve	−	−	−
Tricuspid valve	−	−	−
Blood			+ (Type I)
Brain	−	+*	+ (Type I)
Myocardium		+	

* Non-specific inflammatory areas in region of basal ganglia.

An α type of streptococcus was isolated from the spleen. The other tissues yielded only coliform bacilli.

Case III

The patient, a girl aged 11, had an attack of tonsillitis and developed acute rheumatic fever with joint pains after a week. She was immediately removed to hospital, where she was found to have an active endocarditis. The patient became cyanosed and dyspnoeic, and died after one week with a dilated heart.

A necropsy showed that there was an old rheumatic endocarditis of the mitral valve with stenosis, with acute lesions superimposed. The other valves and the pericardium were healthy.

Pathological Findings

	Naked Eye	Microscopical	Growth of Haemolytic Streptococci
Pericardium	−	−	−
Aortic valve	−	−	+
Mitral valve	−	+	+
Pulmonary valve	−	−*	+
Tricuspid valve	−	+	−
Spleen	−	−	+
Throat			+
Myocardium		+	

* An unsatisfactory specimen.

The other tissues gave a growth of coliform bacilli.

Case IV

This patient, a boy aged 12, had been ill for three weeks at home with vague pains. Precordial pain and friction developed while in hospital but disappeared before he died of cardiac failure two months later. He was febrile throughout his stay in hospital.

At the necropsy there was an acute pericarditis with adhesions between the two layers in places. The inflammation appeared to be regressing.

Pathological Findings

	Naked Eye	Microscopical	Growth of Haemolytic Streptococci
Pericardium	−	+	−
Aortic valve	−	+	−
Mitral valve	−	+	+ (Type II)
Pulmonary valve	−	−	−
Tricuspid valve	−	−	−
Blood			+ (Type II)
Throat			+ (Type II)

Case V

A girl aged 5 had tonsillitis with joint pains three weeks before admission to hospital. She developed chorea and was admitted to hospital with signs of pericarditis. She died after a total illness of three months due to congestive heart failure.

At necropsy acute pericarditis and acute endocarditis of all the valves were present.

Pathological Findings

	Naked Eye	Microscopical	Growth of Haemolytic Streptococci
Pericardium	+	+	−
Aortic valve	+	+	−
Mitral valve	+	+	−
Pulmonary valve	+	+	−
Tricuspid valve	+	+	+ (Type II)
Throat			+ (Type II)
Myocardium		+	−

All four heart valves yielded a culture of a γ type non-haemolytic streptococcus, and the mitral and tricuspid valves yielded an α type non-haemolytic streptococcus in addition. The blood was sterile.

Case VI

A girl aged 7 had an attack of tonsillitis followed by joint pains a week later. She was then admitted to hospital, where pericarditis developed. Her illness lasted eight weeks in all and she died of heart failure.

A post-mortem examination disclosed an acute rheumatic pericarditis with much fibrinous exudate and free fluid. Acute rheumatic vegetations were present on all valves.

Pathological Findings

	Naked Eye	Microscopical	Growth of Haemolytic Streptococci
Pericardium	+	+	−
Aortic valve	+	+	−
Mitral valve	+	+	−
Pulmonary valve	+	+	−
Tricuspid valve	+	+	−

Case VII

The patient, a girl aged 5, was admitted to hospital because she was listless, easily tired, losing weight, and had developed swelling of her feet, legs, and abdomen. She gave a history of "growing pains" during the four preceding months. She was found to have an enlarged heart and a mitral systolic murmur. She died a month after admission.

At necropsy slight acute pericarditis and acute endocarditis of all valves except the pulmonary were present.

Pathological Findings

	Naked Eye	Microscopical	Growth of Haemolytic Streptococci
Pericardium	+	+	−
Aortic valve	+	+	−
Mitral valve	+	+	−
Pulmonary valve	−	−	−
Tricuspid valve	+	+	−

The blood was apparently sterile, yet the aortic, mitral, and tricuspid valves yielded growths of both α and γ type streptococci. The other tissues were sterile.

Case VIII

A woman aged 34 was admitted to hospital as a case of hyperthyroidism. She developed tonsillitis, followed a month later by acute rheumatism with precordial pain and pericardial friction. This was treated with intramuscular injections of streptococcal antitoxin, but she died three days later of heart failure.

Pathological Findings

	Naked Eye	Microscopical	Growth of Haemolytic Streptococci
Pericardium	+	+	−
Aortic valve	−	−	−
Mitral valve	−	−	−
Pulmonary valve	−	−	−
Tricuspid valve	−	−	−
Myocardium		+	−

Case IX

This patient, a boy aged 10, was healthy until seven months before admission to hospital. He developed flitting joint pains while in bed suffering from fracture of the clavicle. Choreiform movements appeared, and he was admitted to hospital, where he died after two weeks. During his period of hospital treatment he was afebrile.

Necropsy showed that old rheumatic mitral and aortic endocarditis with early mitral stenosis and incompetence were present with recent acute endocarditis of mitral and aortic valves, but there were no lesions of pulmonary or tricuspid valves or pericardium.

Pathological Findings

	Naked Eye	Microscopical	Growth of Haemolytic Streptococci
Pericardium	−	−	−
Aortic valve	+	+	−
Mitral valve	+	+	−
Pulmonary valve	−	−	−
Tricuspid valve	−	−	−
Myocardium		+	

Blood and other tissues were sterile. A pneumococcus, Type IV, was isolated from the mitral valve.

Case X

This patient, aged 15, had rheumatic fever with cardiac involvement for three years, and tonsillitis for two weeks, before coming to hospital. The day previous to admission pericarditis was diagnosed, with precordial pain and friction rub. He was febrile till death, two weeks later. Collapse of lower lobe of left dung developed two days before death, and Stokes-Adams attacks appeared the day he died.

Necropsy revealed an old aortic and mitral endocarditis with acute lesions superimposed. Pulmonary and tricuspid valves were healthy. Acute sero-fibrinous pericarditis and acute pleurisy were present.

Pathological Findings

	Naked Eye	Microscopical	Growth of Haemolytic Streptococci
Pericardium	+	+	−
Aortic valve	+	+	−
Mitral valve	+	+	−
Pulmonary valve	−	−	−
Tricuspid valve	−	−	−
Myocardium		+	−

Coliform bacilli were isolated from all tissues, as well as the blood, and in addition an α streptococcus was isolated from the aortic, tricuspid, and pulmonary valves.

Control Necropsies

Ten control necropsies were carried out in the same way as for the cases of rheumatic fever. From none was a haemolytic streptococcus isolated, but from a heart valve in three cases there was obtained an α type streptococcus which was not isolated from the blood.

Discussion

In this series of 10 cases of rheumatic fever a haemolytic streptococcus was isolated from 5. Successful culture was made from 11 valves out of a total of 26 showing acute lesions. This work supports the claims of Green (1939) and Collis (1939).

Death from rheumatic fever in the early acute stage is rare. It is only in valves showing acute lesions and before reparatory processes have been established that the isolation of the infecting organism can reasonably be anticipated. It must be realized that the condition of many cases examined post mortem is such that negative results are likely to be obtained, as many will have survived the early acute phase. Technical difficulties are also encountered, and of these the most important is the presence of other bacteria, especially coliform bacilli, which gain access to the blood either soon after death or in the agonal stage. These bacteria rapidly overgrow the haemolytic streptococcus. For the above reasons the isolation of the causative agent cannot be expected in every case. It is not surprising, therefore, that we were unable to isolate a haemolytic streptococcus from the heart in more than 50% of the cases.

In considering these results two possibilities must be envisaged: first, that haemolytic streptococci are the cause of rheumatic fever and are responsible for the valvulitis by an actual infection of the valve; secondly, that some other process leads to pathological changes in the valves which allow all organisms of various types, including haemolytic streptococci, to lodge there.

In favour of the first hypothesis is the mass of clinical and bacteriological evidence that infection of the upper respiratory tract by haemolytic streptococci precedes and accompanies the syndrome of rheumatic fever. In addition, the finding of Green (1939), Collis (1939), and ourselves that haemolytic streptococci can be isolated from the damaged heart valves of patients dying from rheumatic fever, but not from the undamaged valves of these patients or from the healthy valves of control cases provides strong evidence of this hypothesis. The usual absence of haemolytic streptococci from the blood and their presence in the damaged valve would appear to support this view. It could be argued, however, that the absence of organisms from the blood and healthy tissues was due to the bactericidal effect of blood and tissue reactions, defences which are absent in the avascular vegetations of acute rheumatism.

In favour of the second hypothesis is the fact that the pathological reactions in the valves and myocardium are not those generally accepted as being typical of streptococcal infections. To overcome this difficulty it has been suggested that the patient suffering from rheumatic fever reacts in an abnormal way to streptococcal infection. The joint lesions (which we always found to be sterile) are difficult to explain in terms of an acute infection in view of their fleeting character. If the first hypothesis is correct we would expect that rheumatic valvulitis would develop into malignant endocarditis in the acute or subacute stage of rheumatic fever in a considerable proportion of cases, whereas this result occurs only rarely.

Another argument in favour of the second hypothesis is that other types of streptococci were isolated from heart valves and tissues of cases of rheumatic fever and controls where the blood yielded no such organism. Thus an α streptococcus was isolated from 6 damaged valves and from 2 undamaged valves. A γ streptococcus was isolated from 7 damaged valves. An α streptococcus was isolated from 3 valves of the control series. A pneumococcus, Type IV, was isolated from a damaged valve and an α streptococcus was isolated from the spleen of one of the rheumatic series.

It is obviously dangerous to make dogmatic claims in favour of one type of organism when several have been isolated under identical circumstances. It will be noted, however, that a haemolytic streptococcus was isolated only from damaged valves and never from undamaged valves. Haemolytic streptococci can often be isolated from the blood of cases of scarlet fever if repeated blood cultures are examined, and this slight bacteriaemia probably occurs in ordinary streptococcal tonsillitis, including that which accompanies rheumatic fever. The point at issue is whether or not the isolation of haemolytic streptococci from valves damaged by acute rheumatism represents an actual infection in the valve or a lodgment in the avascular vegetation following a slight bacteriaemia.

The fact that the haemolytic streptococci isolated from throat, blood, valves, myocardium, and brain of any one case were all of the same type (Griffith) would at first appear as strong evidence in support of an actual infection in the rheumatic lesions, but it might be argued that this merely indicates that a blood spread has occurred from the throat. This can be accepted as an argument in favour of either hypothesis, since the results can be interpreted as either a true infection of the tissues or a lodgment of the organism in tissues previously damaged by the rheumatic process.

In conclusion we would say that although at the present time the aetiology of rheumatic fever cannot be said to be solved, we are inclined to support the view that the cardiac lesions are in fact due to infection with haemolytic streptococci.

Summary

Haemolytic streptococci were isolated from the hearts of 5 of 10 patients dying of acute rheumatism and never from controls.

Haemolytic streptococci were isolated from damaged valves, but not from undamaged valves.

Other types of streptococci were isolated from both damaged and undamaged valves, but more often from the former.

The significance of these findings is discussed.

We wish to thank Professors T. J. Mackie, A. M. Drennan, and L. S. P. Davidson for their criticism, encouragement, and support. We desire also to express our thanks to Dr. Agnes McGregor and to the physicians of the Royal Infirmary and the Royal Hospital for Sick Children, Edinburgh, for permission to have access to their wards. One of us (J. I.) was in receipt of the Vans Dunlop Scholarship in Medicine during the period of this investigation.

REFERENCES

Bradley, W. H. (1932). *Quart. J. Med.*, **25**, 79.
Coburn, A. F. (1931). *The Factor of Infection in the Rheumatic State*, Baltimore.
Collis, W. R. F. (1931). *Lancet*, **1**, 1341.
—— (1939). Ibid., **2**, 817.
Eagles, G. H., Evans, P. R., Fisher, A. G. T., and Keith, J. D. (1937). Ibid., **2**, 421.
Glover, J. A. (1930). Ibid., **1**, 499.
—— and Griffith, F. (1931). *British Medical Journal*, **2**, 521.
Green, C. A. (1938). Ibid., **1**, 1147.
—— (1939). *Ann. Rheum. Dis.*, **1**, 86.
Grenet, H. (1920). *Gaz. Hôp.*, **93**, 5.
McCulloch, H., and Irvine-Jones, E. I. M. (1929). *Amer. J. Dis. Child.*, **37**, 252.
O'Meara, R. A. Q. (1934). *Brit. J. exp. Path.*, **15**, 295.
Schlesinger, B. (1930). *Arch. Dis. Childh.*, **5**, 411.
—— Signy, A. G., and Amies, C. R. (1935). *Lancet*, **1**, 1145.

HYPERVENTILATION AND THE EFFORT SYNDROME

BY

E. GUTTMANN, M.D., L.R.C.P.Ed.*

AND

MAXWELL JONES, M.R.C.P.Ed., D.P.M.

Medical Officer, Emergency Hospital

A syndrome is a number of symptoms frequently observed in combination. "Syndrome" is a descriptive term, and is generally used to avoid premature aetiological conceptions. It may ultimately prove to imply a common aetiology or a common mechanism. More often, however, one finds a limited number of causes liable to produce a syndrome—the typical phrase being, "X syndrome may be due to (*a*), (*b*), or (*c*)." Lewis (1940) applies the term "effort syndrome" to the following group of symptoms: Breathlessness, pain (precordial), exhaustion, giddiness, and fainting; palpitation, headache, and lassitude are additional symptoms of less consequence. This symptom-group "is to be found in a variety of pathological states—for example, in early heart disease, in early phthisis, and in exophthalmic goitre. But it is also found, and in much greater frequency, in soldiers in whom no physical signs of structural changes are discovered."

Among those who show no signs of structural disease a post-infective group stands out clearly; the remainder are classified by Lewis into the constitutionally weak (nervous or physical) and an exhaustive group. The aetiology of effort syndrome is still a puzzle so far as the purely "functional" cases are concerned. Because of the present interest in psychosomatic medicine it is to be expected that the "neurotic" group will attract much attention; and, indeed, no observer with some experience in psychiatric cases will fail to see the similarity between effort syndrome and an anxiety state. This similarity has led to a closer analysis of the symptoms and to an attempt to study effort syndrome by a method which has proved useful in elucidating some manifestations of anxiety—namely, the production of symptoms by voluntary hyperventilation.

Symptoms of Hyperventilation

When a normal person overbreathes sufficiently he will produce two sets of symptoms—(*a*) a tetanic type, and (*b*) some disturbance of consciousness. Tingling in the fingertips (or in the toes or lips), numbness of the extremities, stiffness, and a tendency to characteristic postures (*main d'accoucheur*) up to fully developed tetanic spasms, belong to the former group; the description of the symptoms of the latter group varies not only with their intensity but

* Working with a grant from the Rockefeller Foundation.

also with the subject's capacity for self-observation and expression. Numbness in the head, dizziness, far-away feeling, faint feeling, sleepy feeling, and fatigue seem to describe the same experience; and "giddiness," often mentioned, apparently does not signify rotatory vertigo but the same impairment of consciousness.

There is a wide variation in the predisposition of normal persons to produce these symptoms: from observation and impression it seems an indication of the person's vegetative lability. Hyperventilation as such an indicator would be of greater value but for the lack of standardization in regard to the amount of air passed through the lungs (or CO_2 exhaled) per time unit compared with normal ventilation. A rough guide to the responsiveness to overbreathing is the threshold for galvanic excitation of peripheral nerves (called Erb's sign in tetany).

Since Grant and Goldman (1920) described spontaneous hyperventilation tetany many writers have confirmed their findings, and the analysis of this clinical picture in both the physiological and the psychological field has made considerable progress. E. Guttmann (1927) described types of patients in whom states of fear or anxiety were accompanied by feelings of oppression or constriction, followed by overbreathing and tetanic manifestations. He assumed that the latent tetanic disposition of the patients and their potential responsiveness to hyperventilation determined the choice and, later, the mechanism of the emotional reactions in question. Kerr, Dalton, and Gliebe (1937) observed the symptoms described in anxiety states with overbreathing. Fraser and Sargant (1938) showed that many hysterical fainting attacks and fits have hyperventilation as a central mechanism. In their observations, as in those described by Guttmann, the attacks were generally precipitated by emotional disturbance, and their patients showed personality and constitutional features suggesting hysteria.

Aetiology of Effort Syndrome

With these experiences in psychoneurotic conditions in mind Soley and Shock (1938) studied the aetiology of effort syndrome. They quote White and Hahn, who found that 80 out of 100 patients suffering from effort syndrome sighed excessively. Soley and Shock contend that in at least one of White and Hahn's cases the patient was hyperventilating. Soley and Shock studied systematically the respiratory disturbances of patients with effort syndrome and the results of the shift in the acid-base equilibrium due to hyperventilation. They state: "Some or all of the symptoms of which these patients complained were reproduced by deep breathing at the rate of 25 to 30 respirations a minute. However, when this respiratory rate was maintained the symptoms were relieved when 2% CO_2 was added to room air." They show in impressive diagrams the changes in the blood chemistry brought about by hyperventilation in effort syndrome cases, and they come to the conclusion that "the respiratory alkalosis resulting from hyperventilation produces the symptoms of effort syndrome." This, of course, is not identical with the causation of effort syndrome, and the authors themselves refer to the fact "that it has been recognized that the combination of anxiety and effort syndrome produces the symptoms listed variously under the diagnosis of 'soldier's heart,' disordered action of the heart, neurocirculatory asthenia, and effort syndrome."

Soley and Shock have shown that in their cases hyperventilation produced alkalosis and the characteristic symptoms together. The questions, however, remain: Is the same mechanism at work in all cases of effort syndrome? Is it able to account for all symptoms of the syndrome? What is the cause of the hyperventilation?

Investigation of 52 Cases

We made an investigation of 52 cases of effort syndrome which had been diagnosed as such in various hospitals and transferred to the Effort Syndrome Unit, where this diagnosis was confirmed. These cases do not include those in which there is demonstrable organic disease, so that for practical purposes they may be divided into three groups—the psychogenic, the post-infective, and the constitutional.

We use the term "effort syndrome" to describe cases which show an excessive physiological response to some forms of exercise or excitement, the most characteristic signs being breathlessness, palpitation, precordial pain, and fatigue. Shortly after their admission, as soon as the routine examination was carried out, these patients were given a hyperventilation test. There is no doubt that hyperventilation produces the alkalotic changes in the blood demonstrated by Soley, Shock, and others, and we therefore felt justified in measuring only the total ventilation as a check of the patient's co-operation. The patient was told to exhale into an anaesthesia mask connected by a corrugated rubber tube with a Siebe Gorman spirometer. The fact that the mask was not fixed by some mechanical device but was held in position by the patient himself certainly led to an experimental error; but as it always pointed in the same direction—the actual ventilation being higher than our figures—we preferred this to the complicated error which in many instances would result from feelings or fear of suffocation when a fixed mask was used. In 34 out of 52 cases the ventilation was measured; in 9 out of the total the ventilation was less than 10 litres a minute. In the remaining cases the reading varied between 10 and 18 litres. The patients were instructed to keep on overbreathing for ten minutes, and 18 did so. Five more breathed over nine minutes. The others gave up after two to eight minutes; they thought the symptoms too disagreeable. Apart from a few cases in which there was a definite exaggeration or hysterical demonstration we were satisfied that the purpose of the test—the reproduction of symptoms—was fulfilled when the patients gave up, or that they had hyperventilated sufficiently to justify the conclusion that they were not abnormally sensitive to overbreathing. Thus the figures in patients with negative results were as shown in Table I:

TABLE I

No. of Case	Duration of Hyperventilation (Minutes)	Ventilation (l per Minute)
24	9	12*
26	10	10
29	10	12
35	10	16
41	10	6
42	10	12
45	9	12
50	10	10

* Considerable loss.

After ten minutes' overbreathing, or when the patient refused to continue owing to tetanic or other symptoms, mostly dryness of throat, he was asked to describe what he felt. He was asked whether he had experienced the same or similar sensations before; after that, what were the symptoms which led to his admission to hospital (that statement was compared with his statements when his routine history was taken); and, finally, he was questioned as to whether he had felt any of these symptoms during or immediately after the hyperventilation. Leading questions were avoided so far as was possible: it was obvious that on the whole the procedure was apt to suggest positive answers as regards reproduction of symptoms by the test.

Findings

The symptoms complained of by the patients as a result of the test are shown in Table II.

TABLE II.—*Symptoms Complained of*

Paraesthesia	24 instances
Giddiness, dizziness, fainting feeling	27 ,,
Headache	7 ,,
Tremor	10 ,,
Pain in chest	6 ,,
Oppression or shortness of breath	8 ,,
Marked sweating	5 ,,

In 6 cases short attacks of deeper disturbance of consciousness were seen. Twelve cases showed marked Chvostek's sign at the end of the test.

In Table III are given the symptoms reproduced by hyperventilation: first, the patient's description at the end of the test; secondly, those complaints in his history which he said were similar to them.

TABLE III.—*Symptoms Reproduced by Hyperventilation (24 Cases)*

Case		
6	Paraesthesia in lips	After vomiting in migrainous attacks
12	,, in fingers	After pain and overbreathing
14	Pain in chest increased	Pains in chest continuously
15	Sinking feeling and fainting feeling	Sinking feeling in attacks
17	Dizzy, fainting feeling	Giddiness, fainting attacks, headache with fainting feeling
18	Dizzy	Dizzy when walking upstairs
20	Weakness all over	Fatigue
21	Headaches	Headaches with choking feeling and difficult breathing
22	Giddiness	Giddiness after exertion
23	Shaky, giddy	Shaky on exertion, giddy
25	Bit shaky	Always inclined to be shaky
27	Weak all over	Fatigue
28	Dizzy, pains in chest, shaky	Dizzy, pain similar to that under exertion, shaky when upset
32	Giddiness, paraesthesia	Same when walking
34	Tight feeling on chest	Sometimes tight feeling
36	Cardiac pain	Spontaneous cardiac pain
37	Head tremor	General shakiness
39	Tight feeling on chest made worse	Constant tight feeling
40	Pins and needles	Same when he walks about
43	Fatigue	Attacks of fatigue
44	Pain in heart, tingling	Cardiac pain, tingling when in forced position
47	Tingling in lips	Felt once or twice before
48	Giddiness, shivering, sweating	Attacks like this
49	Tightness in chest, paraesthesia	Same as after exertion

Although Table III shows that 24 of the cases examined reproduced symptoms after hyperventilation, it would be premature to assume that these were due to biochemical changes brought about by hyperventilation. In interpreting the patients' symptoms and signs it must be remembered that psychological and physiological factors other than the alteration of breathing may influence the result. The test demands some co-operation, some physical effort, and willingness to stand some physical discomfort. The physical effort is accompanied by an increase in the pulse rate; the psychological effect of the test situation may contribute to this acceleration. At any rate, there is good reason to assume that it is not brought about by the increasing washing out of carbon dioxide: the pulse curves reached their peak generally after the first or second minute of hyperventilation, and were settling down again before the first tetanic symptoms were noticeable. In patients No. 20, No. 27, and No. 43, whose main complaint was fatigue, and who after the test had nothing else to complain of, the effect, if any, was surely psychogenic, and in Cases 25 and 37, which responded by tremor only, the mechanism was similarly unspecific.

In the majority of the 19 cases remaining we find that paraesthesia and dizziness (and kindred symptoms as mentioned before) were the symptoms reproduced, and it seems most important to note that only 4 patients complained of more or less characteristic thoracic pain, which, according to our experience, is a symptom met with in 66% of effort syndrome cases. Tightness in or around the chest was complained of in 3 cases (additional to the 4 cases with pain). Palpitations, present in 94% of our cases, did not occur in a single one of the 52 cases as a result of the test, although after the hyperventilation each patient was questioned particularly with regard to this. It must be pointed out, however, that Soley and Shock's patient did experience palpitations after four minutes' overbreathing.

The position, therefore, is roughly that the majority of patients with effort syndrome produce symptoms after hyperventilation, but only half of them reproduce symptoms similar to or identical with those they complain of ordinarily. Among the prominent symptoms reproduced are those of a tetanic kind (paraesthesiae) and disturbances of consciousness often combined with them. In a comparatively small proportion of the cases the cardinal symptoms of effort syndrome are reproduced—namely, "suffocation" and left chest pain. Palpitation did not occur at all. It would appear, therefore, that hyperventilation can be of importance only in a proportion of cases of effort syndrome.

The results would not have been different if the hyperventilation had been carried out more vigorously and for a longer period: the few patients who showed no symptoms overbreathed to an extent far beyond that corresponding to the effort which otherwise produced their symptoms. All the others ventilated sufficiently to reproduce their symptoms or to show tetanic symptoms which were not a reproduction of their clinical complaint. Since the latter patients showed tetanic symptoms for the first time when hyperventilated it is reasonable to assume that their original symptoms are not related to overbreathing.

Discussion

Our findings are well in keeping with some observations which R. V. Christie (1935) made when studying the respiration in the neuroses in general. He came to distinguish "anxiety neurosis"—which may also include many cases of effort syndrome—with an irregular shallow type of respiration, and conversion hysteria where the tendency is to hyperventilate. He says: "The breathlessness [in effort syndrome] is reflected by a tendency to rapid and shallow breathing rather than a true hyperpnoea. In fact, the shallowness of the respiration may in severe cases lead to an anoxaemia and cyanosis."

We can assume as certain that in some of the cases overbreathing is of minor or even of no importance; it is still left to discuss what part hyperventilation plays in those cases in which the symptoms could be reproduced experimentally by this mechanism.

There appear to be two ways in which hyperventilation may operate in producing the syndrome. In the first of these anxiety plus exertion may bring about hyperventilation and subsequently tetanic and kindred symptoms: this is Soley and Shock's view, and it corresponds to our conception of an anxiety state with similar symptoms. This view is best expressed by speaking of "effort syndrome" complicated by hyperventilation syndrome. Some patients describe such a sequence of events, but it is important to remember that hyperventilation fails to produce palpitations, whereas practically all patients complain of them otherwise. This feature of anxiety occurs spontaneously and leads to hyperventilation and subsequently to other manifestations included in effort syndrome. The second possibility is that there is an habitual state of overventilation; it would be of interest to continue Soley and Shock's investigations on these patients in order to determine whether there is a constant alkalotic tendency (alveolar CO_2 and *p*H of blood and urine). The occurrence of such a tetanoid state has been demonstrated in anxiety cases (Guttmann, 1927).

It is obvious that these two possibilities of hyperventilation operating are not mutually exclusive; but it is

certain that only in some cases of effort syndrome is hyperventilation an aetiological factor.

Summary

Fifty-two cases of effort syndrome have been hyperventilated. Only in 50% of them were clinical symptoms reproduced in this way, and in these the symptoms were those which one commonly associates with tetany—e.g., paraesthesiae and disturbances of consciousness—rather than those characteristic of effort syndrome. We feel that in view of our findings we cannot support the contention of some workers that hyperventilation has an important place in the aetiology of effort syndrome.

We wish to thank Dr. W. S. Maclay, medical superintendent of the Emergency Hospital, for permission to make use of this material, and Dr. Aubrey Lewis, clinical director at the hospital, for his help and advice.

REFERENCES

Christie, R. V. (1935). *Quart. J. Med.*, n.s., **4**, 427.
Fraser, R., and Sargant, W. (1938). *British Medical Journal*, **1**, 378.
Grant, S. B., and Goldman, A. (1920). *Amer. J. Physiol.*, **52**, 209.
Guttmann, E. (1927). *Arch. Psych.*, **79**, 498.
Kerr, W. J., Dalton, J. W., and Gliebe, P. A. (1937). *Ann. intern. Med.*, **11**, 961.
Lewis, Sir Thomas (1940). *The Soldier's Heart and the Effort Syndrome*, 2nd ed., Shaw and Sons, London.
Soley, M. H., and Shock, N. W. (1938). *Amer. J. med. Sci.*, **196**, 840.

OBSERVATIONS ON EFFORT SYNDROME

BY

JOHN D. SPILLANE, M.D., M.R.C.P.
Major, R.A.M.C.

Medical officers in the Forces must now be well acquainted with the characteristic features of effort syndrome. The familiar picture of the distressed young soldier standing before his M.O. apparently short of breath, with an anxious face, rapidly acting heart, complaining of left pectoral distress and dizzy spells, is only too common in our military hospitals. Such patients, both by their number and by their resistance to treatment, constitute quite a problem. During the war of 1914–18 Lewis found that 51% of a group of 558 soldiers with the condition were unfit for all military service. Grant (1925) in a follow-up study of 601 discharged soldiers with effort syndrome reported that 56.2% failed to improve over a period of five years; only 15.3% had completely recovered.

The heart is usually normal, but at first sight the symptoms seem to be those of circulatory distress, and their presence without demonstrable cardiovascular disease is the paradox awaiting explanation. The view currently adopted is that the syndrome arises in those individuals who, whether from hereditary causes or as a result of unaccustomed strain or debilitating illness, have unstable neurocirculatory mechanisms. For this reason Oppenheimer (1918) employed the term "neurocirculatory asthenia" to describe the condition, instead of "soldier's heart," "disordered action of the heart," or "irritable heart of soldiers." This has remained the accepted designation in the United States of America "because it expresses its abnormal character by referring to both neurasthenic state and circulatory symptoms, and at the same time it does not limit the term to 'effort' or 'irritability' or 'soldier'" (White, 1937). Psychiatrists may join issue on the use of the term "neurasthenia" and stress the rarity of that condition in the pure state, but for the general physician the term still denotes a morbid fatigability and irritability of the nervous system. The term "effort syndrome" has probably come to stay, but it is as non-descriptive as it is non-committal.

The following notes are based on observations made at one military hospital in the Home Command during the past year. The cases form a rather ill-defined group, and the borderline is indistinct and easily crossed. At one extreme we find the normal though often bizarre response of the untrained individual to Army life, and at the other the frankly abnormal reaction of the true anxiety case. Effort syndrome cases seem to occupy an intermediate position.

Aetiology

None but the most casual observer could fail to detect the fundamental importance of hereditary and constitutional factors in the development of the illness. The individual is rarely of the "athletic" type; even if his build is average his inclinations are often sedentary. In reality he seems more untrainable than untrained. For some reason or other exertion has always been avoided, and his recreation has usually been fitful and non-energetic. Although in many instances signs of defective physical development are encountered, the existence of similar and even greater handicaps among successful soldiers indicates that some other factor is at work. This is probably a nervous one. Minor physical defects, such as a flat chest, a kyphotic spine, or puny musculature, if accompanied by a robust nervous system do not predispose to breakdown. Neither are they always hereditary; they just as frequently indicate a lack of physical training. The neuropath is less likely to indulge in physical activity than a normal person; he is consequently often incapable of it in later life and may be poorly developed. It appears, therefore, that the fundamental hereditary factors are those which affect the nervous rather than the physical constitution. This is borne out by the fact that there seems to be a higher incidence of minor nervous disorders in the near relatives of such men.

Circulation Time

By the circulation time is meant the time necessary for the blood to pass from one point in the vascular system to another. It is a measure of the velocity of blood flow, which in turn is closely related to the cardiac output and the circulating blood volume. During effort the cardiac output in the normal individual is greatly enhanced and the velocity of blood flow is increased. Even at rest the circulation of the patient with hyperthyroidism closely resembles that of the normal individual during exertion. In both there is tachycardia, increased cardiac output, and acceleration of blood flow. During the last war hyperthyroidism was suspected in many cases of effort syndrome in view of the tachycardia, tremor, flushed skin, hyperidrosis, and warm moist hands which were commonly present. Moderate thyroid enlargement was occasionally observed (Lewis, 1940). But the fundamental difference between these two conditions lay in their response to rest. Patients with effort syndrome improve rapidly, while the accelerated circulation of the hyperthyroid individual remains unchanged.

In 30 soldiers suffering from varying degrees of effort syndrome it was found that the velocity of blood flow, estimated by the saccharin and ether methods, was not appreciably altered. The normal arm-to-tongue circulation time (saccharin method) lies between 9 and 16 seconds (Fishberg, Hitzig, and King, 1934), and in 27 of our patients it fell well within normal limits. In the remaining 3 individuals readings of 8 seconds, 8 seconds, and 6 seconds, respectively, were obtained; these variations were not considered significant. Likewise the arm-to-lung circulation time (ether method) was found to be normal in each case: normal time lies between 4 seconds and 8 seconds (Hitzig, 1935).

These studies were made on patients who had been lying down for fifteen to thirty minutes. They show that under such conditions the velocity of blood flow was

normal. The next point to investigate was the effect of exercise on the circulation rate. Each patient was made to skip with a rope for five minutes; the ether time and saccharin time were then taken and repeated five minutes later. Twelve patients were studied by this method after controls had been observed in twelve normal soldiers. The results are summarized in the accompanying table.

Table showing Effect of Exercise on Velocity of Blood Flow

	Normal Controls		Effort Syndrome Cases	
	Ether Time	Saccharin Time	Ether Time	Saccharin Time
	secs.	secs.	secs.	secs.
Case 1 (a)	6	13	5	11
(b)	5	13	5	13
(c)	6	11	6	13
Case 2 (a)	5	12	7	12
(b)	5	12	6	13
(c)	6	13	6	14
Case 3 (a)	6	15	8	17
(b)	7	14	?	15
(c)	5	13	6	10
Case 4 (a)	5	15	8	11
(b)	6	14	4?	11
(c)	6	14	5	8
Case 5 (a)	?	8	7	13
(b)	7	8	6	12
(c)	7	?	8	9?
Case 6 (a)	8	15	7	5?
(b)	7	12	?	9
(c)	7	13	?	10
Case 7 (a)	8	14	5	10
(b)	5	13	6	13
(c)	4?	16	6	14
Case 8 (a)	5	8	6	9
(b)	?	8	6	10
(c)	7	?	7	12
Case 9 (a)	6	13	10?	16
(b)	7	11	8	13
(c)	7	17?	8	12
Case 10 (a)	5	12	4	16
(b)	6	10	6	16
(c)	6	9	6	14
Case 11 (a)	8	11	6	13
(b)	4?	11	7	10
(c)	4?	13	6	15
Case 12 (a)	6	6	7	13
(b)	5	6?	5	12
(c)	5	?	4	11

(a) = At rest; (b) = after exercise; (c) = five minutes later.

In no patient was there an abnormal increment in the circulation rate, and in only one was there an appreciable delay in the return to normal. These findings are in contrast with those observed in hyperthyroidism after exercise. Bansi and Groscurth (quoted by Fishberg, 1937) found that in hyperthyroidism the increase in cardiac output during exercise was excessive and that there was a delay in the return to normal after cessation of effort.

In effort syndrome patients, then, we may infer that any distress experienced during or shortly after physical exertion is not due to any fundamental weakness of the *cardiovascular* mechanism. Rather is it an indication of abnormal *nervous* reaction. The majority of affected individuals tested as described above experienced faintness, palpitations, left mammary discomfort, or vague general distress, and the emotional factor was obvious. Herein lies the inadequacy of exercise-tolerance tests. The emotional component cannot very well be excluded, and it colours the whole test. The routine tests more often determine the training, the physical fitness, and the nervous state than the degree of cardiac efficiency. In patients suffering from the effort syndrome it is the former factors which determine the unusual response to such tests.

Sighing Respirations

Although during exertion and for a short period afterwards there may be an abnormal increase in the respiratory rate, the affected individual is not usually dyspnoeic at rest. Sometimes he may be distressed by the consciousness of the respiratory act, but true tachypnoea is not common. A very frequent phenomenon is the abnormal increase in a tendency to sigh (White and Hahn, 1929). The latter authors produced spirographic evidence of this and found it a helpful sign of the existence of neurocirculatory asthenia. In purely organic heart disease the sign is rare. I have found it the commonest respiratory disorder shown by these patients while at rest. Not infrequently one can hear the periodic sighs on the other side of the examination screen, where the patient awaits interview. During the actual examination it is often more obvious, though the patient himself is not conscious of it. Poor breath-holding power and a jerky irregularity of the respiratory rhythm are also commonly found, but true hyperventilation (Sargant, 1940) I have only once observed. The latter is almost certainly not a causative factor, but is merely one of the several respiratory manifestations of emotion and anxiety.

Carotid Sinus Sensitivity

It has been known for some time that experimental stimulation of the carotid sinus in animals and man can reflexly inhibit breathing and reduce the blood pressure and heart rate. It is only of recent years, however, that this knowledge has received practical clinical application. The investigations of Weiss and Baker (1933) and Ferris, Capps, and Weiss (1935) have shown that in certain individuals who experience attacks of giddiness, syncope, or even convulsions, seizures can often be evoked by pressure on the carotid sinus. That these attacks result from hypersensitivity of the carotid sinus was shown by the relief obtained by cocainization or denervation of the sinus. In its fully developed form carotid sinus syncope is usually found in those who are arteriosclerotic, but it may also be encountered in younger subjects. I have seen a left-sided convulsion follow pressure on the right carotid sinus of a soldier aged 21; this is exceptional. I have applied this test to the majority of cases with effort syndrome encountered. In about 90% there is no abnormal response, but owing probably to their general nervous state the procedure is more distressing for them than for normal individuals. (This remark also applies to the procedure of taking a blood-pressure reading.) In several instances, however, acute dizziness, faintness, altered respiratory rate and rhythm, and even syncope, have resulted. Slowing of the heart and/or a drop in blood pressure were inconstantly noted. These attacks may be analogous to those induced by Cotton and Lewis (1918) by the act of withdrawing blood from a soldier suffering from effort syndrome. The mechanism of the latter was vagal inhibition of the whole heart with electrocardiographic evidence of sino-auricular block. The relief obtained with atropine confirmed this. These observations are in accord with the concept of a hyperactive vegetative nervous system. The carotid sinus is only one of a number of mechanisms which may alter the tonus of this system. Its importance lies in the fact that its varying sensitivity enables one to demonstrate a definite physiological abnormality of the nervous system in a group of individuals whose behaviour is largely "neurotic": it suggests that physiological and not psychical mechanisms may be the fundamental abnormality, or an accessory factor, in a small percentage of cases of effort syndrome.

Left Mammary Pain

The cause of this pain is quite unknown. There is little to indicate whether it is of psychogenic or of physiological origin. Is it a genuine pain or is it but a mental image of pain? There is no evidence (unless, of course, one accepts the *fact* of pain as indicating that somewhere between the cutaneous sensory nerve endings and the brain there must be a stimulating lesion) that the physiological mechanism for pain production is involved, whereas the emotional background suggests that psychogenic factors are more important. Nevertheless one does not

encounter the fantastic terminology, with its wealth of superlatives, that so often colours the account given by the hysterical patient in describing his pain.

It is unsafe to assume that cutaneous hyperaesthesia, muscle tenderness, erection of the nipple, and goose-flesh in the left pectoral region necessarily imply that the pain is of muscular origin. Signs more gross even than these may accompany true hysterical pains.

The natural tendency to classify pains as "physiological" or "psychogenic" may be quite unjustified. We know that a psychological stimulus can activate a physiological mechanism: the common blush is an example of this.

On a few occasions during the course of examining an affected soldier I have noticed a curious erection of the left nipple; left mammary pain or discomfort was prominent and the pectoral muscles were tender and sensitive. It is presumably only a manifestation of the hyperaesthetic state of the tissues of that region in these individuals. Lewis has commented on "the myotatic irritability of the pectoral muscles" in the more seriously affected cases, and I believe erection of the left nipple has been observed during true anginal paroxysms.

Psychoneurotic Symptoms

The majority of published accounts of the effort syndrome have dealt mainly with its somatic manifestations. There are probably two main reasons for this. First, *bodily* symptoms and signs more readily attract the attention of both patient and doctor, and the presence of *psychological* difficulties may not be suspected. Secondly, when during the last war the syndrome first received wide recognition knowledge of the psychoneuroses was very limited and their study was hindered by an emotional bias. Despite much scornful talk there is no doubt that a wider and saner outlook on these conditions characterizes the attitude of the younger medical men to-day. On the other hand, in certain circles, judging from recent utterances and from one's personal experience, the complaints of the neurotic still arouse mistrust and his treatment still tends to be of the hearty "smack-on-the-back" type or else an irritated resort to "discipline."

Probably the commonest symptom in the effort syndrome is *anxiety*. In many cases it is at once obvious, while in others both patient and doctor may at first be unaware of it. This apparently unmotivated anxiety expresses itself in periods of vague fears which the subject is not usually willing to discuss. Patients often deny the existence of any psychological difficulties, and persistent inquiry may be necessary before their presence is acknowledged.

Treatment

Continued observation of these men has not been possible, so that remarks upon treatment cannot usefully be made. However, the importance of recognizing the true nature of the complaint when the soldier *first* reports sick cannot be exaggerated. Diagnosis by exclusion, as is the traditional advice in neurosis, is no longer necessary. It postpones early diagnosis and consequently makes treatment more difficult. The patient needs an explanation of his condition and reassurance at the first interview. Indecision, the adoption of a light manner, and repeated examinations of the heart by different medical officers serve only to aggravate the trouble.

Summary of Conclusions

The group of patients who are diagnosed as suffering from the effort syndrome are psychoneurotics in whom somatic manifestations, in the cardiovascular sphere, are prominent. Psychological difficulties are also present, but are frequently masked. There is no evidence that a fundamental physiological defect is at work in the majority.

REFERENCES

Bansi, H. W., and Groscurth, G. (1931). *Z. ges. exp. Med.*, **77**, 631. Quoted by Fishberg, A. M. (1937). *Heart Failure*, Lea and Febiger, Philadelphia, p. 528.
Cotton, T. F., and Lewis, T. (1918–20). *Heart*, **7**, 23.
Ferris, E. B. (jun.), Capps, R. B., and Weiss, S. (1935). *Medicine*, **14**, 377.
Fishberg, A. M., Hitzig, W. M., and King, F. H. (1934). *Arch. intern. Med.*, **54**, 997.
Grant, R. T. (1925). *Heart*, **12**, 121.
Hitzig, W. M. (1935). *Amer. Heart J.*, **10**, 1080.
Lewis, T. (1940). *The Soldier's Heart and the Effort Syndrome*, 2nd ed., Shaw and Sons, London.
Oppenheimer, B. S., *et al.* (1918). *Military Surgeon*, **42**, 711, Washington, D.C.
Sargant, W. (1940). *Lancet*, **1**, 314.
Weiss, S., and Baker, J. P. (1933). *Medicine*, **12**, 297.
White, P. D. (1937). *Heart Disease*, 2nd ed., p. 374, Macmillan Company, New York.
—— and Hahn, R. G. (1929). *Amer. J. med. Sci.*, **177**, 179.

SULPHONAMIDE THERAPY IN LUPUS ERYTHEMATOSUS

BY

F. GLYN-HUGHES, M.D., Ch.B.

Senior Dermatologist, Liverpool City Hospitals; Honorary Dermatologist, Liverpool Radium Institute and Hospital for Skin Diseases

AND

A. M. SPENCE, M.B., Ch.B.

Honorary Assistant Dermatologist, Liverpool Radium Institute and Hospital for Skin Diseases

The treatment of lupus erythematosus is still in an unsatisfactory state. Discovery and eradication of a toxic focus will often cause the condition to clear up, but frequently no focus can be found, and even when performed on reasonable grounds tonsillectomy and teeth extractions, etc., often give very disappointing results. Gold therapy cannot be said to have solved the problem. In view, however, of the probable streptococcal origin of the disease it seems feasible that drugs of the sulphonamide class might be of value in treatment.

For about two years patients attending the Liverpool Skin Hospital have been treated with sulphonamide preparations subsequent to investigation for any toxic focus. In the majority of cases sulphapyridine (M & B 693) was used, but a few were treated with sulphanilamide. Force of circumstances necessitated that in all cases the treatment be ambulatory. In the earlier cases the dose was 1.5 grammes daily, but later this was reduced to 1 gramme and in some cases even 0.5 gramme daily. 1 gramme daily gave a very satisfactory response on an average and appeared to reduce the incidence of undesirable effects. Gastric symptoms were common, but with the exception of two cases were of a trivial nature.

As the patients attended only at weekly intervals it was difficult to estimate accurately the percentage who suffered from a febrile reaction, but probably this occurred in four cases, and two of these had erythematous eruptions of a transient nature. It is debatable whether this reaction can be classed as drug fever. Hageman and Blake (1937) encountered drug fever in 15.6% of a series of cases of various conditions treated with sulphonamide. Barber (1940), on the other hand, while treating cases of lupus erythematosus observed a febrile reaction in as many as 72.7%. He quotes this high percentage in support of his view that the reaction is not due to drug fever but to streptococcal toxin liberated by the drug from latent foci of infection.

The four cases mentioned above constitute 25% of our series and are therefore inconclusive. We found, however, that readministration of the drug resulted in a

diminished reaction, whereas in drug fever the reaction is often accentuated.

Owing to the fact that every case responded in some degree the treatment of the more resistant was prolonged, frequently at the entreaty of the patient as there appeared hopes of a complete cure. The risk of causing blood dyscrasias is, of course, admitted, and blood examinations were made both *during* and *after* the cessation of treatment. Two patients suffered from a mild degree of anaemia, but otherwise no pathological changes in the blood were encountered. It is possible that such changes occur where concentrated amounts are administered rather than where the dose is spread over a prolonged period. Details of the cases are as follows.

Case Histories

Case 1.—A woman aged 25 had a patch involving the left cheek and the nose of five years' duration. She had been treated with local applications, bismuth injections, and gold injections with no improvement. She was given 1 gramme of sulphapyridine over a period of four months with two intervals of one week. At first there was steady improvement: the scales disappeared and the erythema faded. The condition later became stationary. After a month's interval she was treated with a total of 75 grammes of sulphapyridine and 50 grammes of sulphanilamide over a period of six months. No further improvement occurred, and since the cessation of treatment the disease is slowly spreading.

Case 2.—A woman aged 39 had a patch on the scalp of three years' duration and three lesions on her fingers. She had been treated with bismuth injections with little improvement. She responded rapidly, and after a month's treatment with 1 gramme of sulphapyridine daily was much better. The dose was increased to 1.5 grammes daily, but complete cure was not obtained. After an interval of two months she had a further course of 0.5 gramme of sulphanilamide daily. Her fingers cleared up completely, but after months of treatment a small patch still remained on her scalp.

Case 3.—This patient, a female, had a patch involving the right cheek and side of nose of two months' duration. She had 17 grammes of sulphapyridine in a month. By that time the condition had completely cleared and there has been since no sign of the disease.

Case 4.—A woman aged 33 had a characteristic butterfly lesion of three months' duration. This completely cleared up after she had taken 25 grammes of sulphapyridine. Two slight relapses necessitated further treatment. She had in addition gynaecological treatment for a cervical erosion which had been overlooked, and has now been free from any sign of disease for four months.

Case 5.—A woman aged 44 was affected on both cheeks and nose. The condition was of eight years' duration. She had been treated with bismuth and gold injections without improvement. In five weeks 35 grammes of sulphapyridine produced a marked improvement. The disease then tended to become stationary. The dose was increased after a rest period to 1.5 grammes daily, but her condition failed to clear completely.

Case 6.—A woman aged 53 had had an attack thirteen years ago which cleared up. In 1931 there was a recurrence involving both cheeks very severely. Her teeth were extracted and her tonsils removed and a long course of bismuth was given without any benefit. She had a total of 112 grammes of sulphapyridine over a period of six months. Improvement was rapid, but treatment was delayed owing to febrile reactions. At the end of six months pigmentation was the only sign of the disease. She has now remained clear for over a year.

Case 7.—A woman aged 45 had been affected over both cheeks and the brow for seven years. She had been treated with bismuth with no result. She received 1 gramme of sulphapyridine daily for three months with two intervals of a week. At first she improved greatly, but later relapsed and further treatment gave no benefit.

Case 8.—A woman aged 41 had a butterfly lesion on the face. The disease was of eight years' duration, but during that time she had two remissions. Neither gold nor bismuth had helped her during her present attack. Over a period of five months she received 112 grammes of sulphapyridine. There was steady improvement and the condition cleared completely. We subsequently lost trace of her.

Case 9.—This patient, a man aged 36, had a patch on the scalp of three years' duration. He was treated with 1 gramme of sulphapyridine daily for three months with slight improvement. After a rest he had another course of treatment, but without further benefit.

Case 10.—A woman aged 45 gave a history of the disease of sixteen years' duration. It had spread over the greater part of her face in spite of repeated bismuth injections. She was treated with 1 gramme of sulphapyridine daily with marked improvement. She was, however, troubled by febrile reactions and gastric irritation, and when these recurred on the resumption of treatment refused to continue. She subsequently relapsed into her former condition.

Case 11.—A woman aged 43 had a butterfly lesion of one year's duration on the face. She was treated with 1.5 grammes of sulphapyridine daily, but ceased treatment owing to a febrile reaction. She was induced to start again, and after four weeks' treatment with 1 gramme daily was completely clear, and has remained so for five months.

Case 12.—A woman aged 44 had a patch on her nose of six months' duration. She was treated with 1 gramme of sulphapyridine daily for three weeks. The condition cleared completely. After a month she relapsed. A further three weeks of treatment again healed the lesion. She has since remained clear.

Commentary

There was a definite response to sulphonamide therapy in each of the twelve cases cited, a point which strongly supports the theory of a streptococcal origin of the disease. In fact, even among the failures some of the chronic sufferers were very loath to abandon the treatment owing to the hopes to which the initial success had given rise. Six cases, or 50%, were completely healed and have remained so. The existence of some latent and resistant focus of infection is the probable cause of failure in the other cases. Case 4 illustrates this point. This patient relapsed twice, but after a previously overlooked cervical erosion had been dealt with she was completely cured.

The successful cases included all those patients who had not suffered from the disease for more than a year. When it is considered that roughly 25 grammes of sulphonamide administered over a period of about four weeks has been successful in clearing up what is regarded as an intractable disease the effect of the drug appears well-nigh specific and suggests that the prognosis in early cases is very favourable.

REFERENCES

Hageman, P. O., and Blake, F. G. (1937). *J. Amer. med. Ass.*, **109**, 642.
Barber, H. W. (1940). *Lancet*, **1**, 583.

A. H. Petitot (*Thèse de Paris*, 1940, No. 326) records twenty-two cases in children aged from 2 to 15 years who had undergone removal of tonsils and adenoids and were treated prophylactically by application of *x* rays to the spleen and administration of calcium chloride by mouth. The technique was as follows. Every child who showed an abnormal bleeding or coagulation time was treated by irradiation of the spleen, and twenty-four hours before the operation was given calcium chloride by mouth in doses of 4 grammes daily. In eighteen cases a single application, and in four two applications, of *x* rays were sufficient to make the bleeding and coagulation times normal. None of the children showed any abnormal haemorrhage either at the time of the operation or after it

Clinical Memoranda

A Penetrating Wound of the Knee-joint

It is as yet too early to draw general conclusions concerning the results obtained by treatment of the deep and lacerated wounds caused by bomb fragments. While the acknowledged principles of wound excision and complete fixation of the injured part have once again proved their worth, there are other factors which must remain *sub judice* for some time yet. One of these is the action of sulphanilamide powder applied direct to a wound, either to render more certain the effect of excision or to replace this procedure. Although the following case is the only one of its kind I have met with during recent activities, it seemed from several points of view well worth recording.

Case Report

A boy aged 14 was injured in an air raid. He was admitted to hospital in the usual state of shock with a large lacerated wound on the front of the left thigh about three inches above the patella. Previous experience led me to expect a bomb fragment in the depths of the knee-joint. Administration of a pint of plasma-saline allowed of treatment some three hours later, when *x*-ray examination showed, contrary to expectation, that no foreign body was present. Excision of the wound revealed laceration of the tendon of the rectus femoris and the quadriceps insertion to the patella, and when all frayed tissue was removed the supra-patellar pouch of the knee-joint gaped. Gentle irrigation with saline removed blood clot from the joint cavity, and it then became obvious that the posterior synovial lining had been flayed, together with the subcrureus and a small fragment from the femur. These deep tissues were brought together with catgut sutures. One gramme of sulphanilamide powder was placed directly in the knee-joint. The anterior tissues, including skin, were closed with one layer of interrupted silkworm sutures of the inverted mattress type.

The subsequent course of the case was interesting. The patient remained completely afebrile. No effusion into the knee-joint sufficient to aspirate was ever detected. Healing was perfect, by first intention, and to date (November 12) 25 degrees of active flexion have appeared at the knee.

Comment

The points to which I would draw particular attention, as worthy of consideration in other cases of this kind which must occur, are: (1) the apparent impunity with which sulphanilamide may be introduced directly into a joint; (2) the absence of any reactionary effusion following this procedure; (3) the fact that deep catgut sutures could be used in a situation where "dead space" as represented by the knee-joint, abounded.

Liverpool. E. N. Wardle, M.Ch.(Orth.), F.R.C.S.

Metastatic Bone Infection with Terminal Meningitis due to B. coli

The following unusual case may be considered worthy of record.

Case Report

A man aged 57 who had spent thirty years in Singapore returned home two years ago. Twelve years ago he had amoebic dysentery, which cleared up quickly with emetine. Since 1933 he had auricular fibrillation, treated at first with quinidine, and later, as fibrillation persisted, with digitalis. There was no history of rheumatic fever and no valvular disease. The Wassermann reaction was negative. He lost two brothers and one sister several years before from pulmonary tuberculosis.

During the cold weather of last winter he felt vaguely unwell, but went up to his business in town, dosing himself occasionally with quinine or aspirin. At the beginning of April he complained of night sweats and had to stay in bed. He had an intermittent pyrexia ranging from 98° to 103°. He was thin and sallow, and had auricular fibrillation, well controlled by digitalis. Leucocytes numbered 23,000 per c.mm., with 91.5% polymorphs. In the urine there was a trace of albumin, but no blood, pus, or bacteria. Radiographs of the chest revealed nothing abnormal.

He was given 3 grammes of sulphapyridine (M & B 693) daily for five days, without any improvement either in his general condition or in the blood picture. At this time his liver was palpable and occasionally tender; the possibility of amoebic hepatitis was considered, and three injections of 1 grain of emetine were given, after which he refused further treatment with emetine. Several specimens of stool were examined; they contained no amoebae or cysts. His condition improved considerably with emetine, the temperature settling and the leucocytes falling to 17,500 on May 2, and 11,800 on May 13. On April 29 he complained of a tender nodule in the right pectoral muscle which disappeared in two days. On May 8 a tender raised node appeared on the right shin, and four days later a similar symmetrical papule appeared on the left shin.

On May 13 there was slight burning on micturition, and the urine was found to contain pus cells and *B. coli*. He was given sulphanilamide, 3 grammes daily. After five days the urine was unchanged and the sulphanilamide was discontinued. Some induration and swelling now appeared around the right fibula: the nodes over the tibiae had the appearance of erythema nodosum and were excessively tender and painful. A radiograph showed no bony abnormality; there was no *x*-ray evidence of osteomyelitis at this time. The Widal test for the typhoid group was negative. He was then treated on general lines, with a nourishing diet, plentiful fluids, and fresh air.

On June 6 the lumps on the legs increased rapidly in size, and fluctuation was detected. On aspiration pus was obtained which gave a pure growth of *B. coli* on culture, and the abscesses were then incised: they were subperiosteal. A radiograph now showed extensive osteomyelitis of both tibiae and the right fibula, with very little periosteal reaction. After incision plaster-of-Paris splintage was applied to both legs. The temperature now started to fluctuate, and some tenderness over the gall-bladder, with enlargement of the liver, was noted. As the temperature failed to settle the gall-bladder was explored: it was normal, and culture from bile remained sterile.

Following the operation the temperature steadied, but on June 27 the patient had a rigor and complained of tenderness at the lower end of the right ulna. A radiograph revealed osteomyelitis here also, and an incision was made through the periosteum and pus was obtained. On July 3, the patient being more anaemic (haemoglobin 50%), a drip transfusion was given and the haemoglobin rose to 65%. On July 7, as pyrexia was continuing and the patient was obviously going downhill, a course of sulphathiazole was tried, starting with 1 gramme intravenously four-hourly for the first day, then 1 gramme four-hourly by mouth until a total of 40 grammes had been given. During this treatment he had repeated rigors, and no good effect was noted in the temperature or in the condition of the urine. On July 13 he had pain over the cardiac apex, and a pericardial rub could be heard; this disappeared in thirty-six hours. On July 20 he complained of intense occipital headache; he vomited and became confused and then drowsy. He developed aphasia and paralysis of the right arm and hand on July 21, and died the next day.

Post-mortem Examination.—A large amount of pus containing *B. coli* was present in the subarachnoid space, especially at the base of the brain and in the posterior fossa. No intracerebral abscess was present. The urinary tract appeared normal, but there was diverticulosis of the descending colon, which presumably was the source from which the organisms reached the blood stream and settled in the bones and meninges.

Commentary

Generalized and metastatic infections with the colon bacillus in the absence of obstructive lesions in the urinary tract or other renal damage are rarely fatal. Metastatic abscess in bone in bacteriaemia due to this organism is also very unusual, and the failure of chemotherapy disappointing.

P. L. Richardson, M.B., B.S.,
Honorary Surgeon, Kent and Sussex Hospital.
Tunbridge Wells. J. M. Ranking, M.B., M.R.C.P.

Reviews

BIOLOGICAL OXIDATIONS

On Oxidation, Fermentation, Vitamins, Health and Disease. By Albert V. Szent-Györgyi, M.D., Ph.D., Professor of Medicine and Organic Chemistry, University of Szeged. (Pp. 109. 11s.) The Abraham Flexner Lectures. Series No. 6. Baltimore: The Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1939.

Our knowledge of the enzyme systems which supply energy to the living cell has advanced remarkably during the past few years. Unfortunately the advance has revealed an ever-increasing complexity in these systems, and descriptions of modern ideas on this subject tend to be just as incomprehensible to the non-expert as is a wiring diagram of a modern wireless set to a person ignorant of the laws of electricity.

Professor Szent-Györgyi, the Nobel laureate, has played a distinguished part in the development of our present knowledge of cellular oxidation, and his complete grasp of the subject has enabled him to provide in a recent series of lectures a clear and accurate account of the fundamental principles in terms that can be understood by anyone who has even an elementary knowledge of biochemistry. He stresses the fundamental principle that, as regards release of energy, the cell cannot make jumps but has to proceed by small steps. Apparently the sudden release of a large amount of oxidative energy would wreck the cell, and hence oxidation must proceed cautiously. He suggests that the "currency unit" of the cell as regards energy exchange is the liberation of eleven calories per gramme-molecule reacting. This implies a large number of steps in any simple oxidative process. For example, the reaction $2H + O = H_2O$ releases sixty-eight calories, and hence the cell has to carry through this change in about six separate steps. The need to maintain control of the rate of energy liberation also implies that the cell can only use reactions that do not occur spontaneously and are brought about by the special mechanisms possessed by the cell. In addition to these complications the evidence suggests that primitive life was anaerobic and that aerobic mechanisms have been added to more primitive systems. These fundamental conceptions make intelligible the complexity of the cellular enzyme systems, which at first sight appear so irrational. The general conception of the oxidation of a carbohydrate such as glucose is that the chain is split and then the fragments are gradually stripped of hydrogen atoms by a series of dehydrogenases; finally oxidation is carried out by a series of cytochrome oxidases.

In the course of these lectures the author gives an interesting account of how he came to discover ascorbic acid. He began with a study of the adrenal cortex, and this led to a consideration of the disorders of pigmentation in Addison's disease. Next the discoloration of the injured tissues of fruits and vegetables was studied and a powerful but unknown inhibitor of this reaction was found to occur in the juice of certain plants. Scientific curiosity caused the author to devote some years of work to this unknown substance, which turned out in the end to be ascorbic acid or vitamin C: "In this way I became a father without wishing it—the father of a vitamin. Such accidents seem to happen even in science." It is of interest to reflect that this accident happened because the author was free to follow his fancy, and would not have occurred if he had been bound by the ties of a carefully planned scheme of research.

CANCER IN CHILDHOOD

Cancer in Childhood: and a Discussion of Certain Benign Tumours. Edited by Harold W. Dargeon, M.D., F.A.A.P. (Pp. 114; illustrated. 15s. net.) London: Henry Kimpton. 1940.

Dr. Dargeon has done good service in collecting in book form summaries of the efforts and experience of various members of the staff of the Memorial Hospital in New York. His aim is to emphasize the importance of cancer as a disease of children. In his own contribution he remarks that cancer is not evidently a major problem in paediatrics, since it is unusual in general practice and uncommon even in special hospital practice; nevertheless, it is as important as a cause of death of children under 15 as some of the more common diseases. Improvement in the present discouraging death rate may occur when earlier recognition of the disease permits correspondingly earlier treatment. The observations here recorded were made on a comparatively large group of children and in a hospital devoted entirely to the study and treatment of tumours; they show both the extent of current knowledge and the need for other collective investigations.

Dr. James Ewing contributes an introductory review and draws attention to important features in the age incidence of tumours. In the first two decades of life, and especially up to the fifteenth year, there are many specific neoplastic diseases which are not found in later life. The conditions of origin and the clinical course of these diseases are so peculiar that properly they may not be compared with any adult tumours; the subject deserves to be treated as a special department in the descriptive history of neoplastic diseases.

This book illustrates a notable variety of rare tumours, in addition to the well-known tumours of childhood. Chapters are devoted to malignant tumours of bone; lymphomas, leukaemias, and allied disorders; cancers of the genito-urinary organs; gynaecological cancer; cancer of the head and neck; tumours of the soft somatic tissues; and tumours of the blood and lymph vessels. The book is well produced and generously illustrated.

ORIENTATION OF ANIMALS

The Orientation of Animals: Kineses, Taxes, and Compass Reactions. By Gottfried S. Fraenkel and Donald L. Gunn. (Pp. 352; 135 figures. 21s. net.) Oxford: Clarendon Press. 1940.

This book is another volume in the series of monographs on animal biology edited by G. R. de Beer, F.R.S., and is well up to the standard of the preceding volumes: its keynote may perhaps be gathered from the following passages from the last chapter:

"It is generally assumed—and it is a pure assumption, though a valuable one—that organic activities conform to rules of a physical and chemical sort and may eventually be described in the fundamental terms of these branches of science. It is not necessary to await that distant day before investigating behaviour and describing it in terms of a different sort. Automobiles and their parts may be the legitimate subject of researches by an atomic physicist, a metallurgist, a mechanical engineer, a cost accountant, a traffic expert, and a sociologist. Similarly, the nervous system and the results of its activities may be profitably studied on various planes—physical, chemical, morphological, physiological, psychological, and so on. . . . In comparative psychology—which includes the study of the behaviour of whole animals and of parts of animals when that is helpful—it is usual to attempt to describe behaviour in the simplest terms . . . but in practice physical and chemical terms are preferred. If these are insufficient in the existing state of knowledge, reflexes are brought in; if that is still not enough, as in maze learning, then a higher plane of behaviour has to be postulated, a plane of

behaviour which is not at present capable of description in terms of lower planes except in very speculative fashion."

The volume is divided into two parts, of which the first is intended for undergraduate students and the second for advanced students and research workers. It is unlikely that any student having made acquaintance with the fascinating account given in Part I will be content to leave it at that, for the book is most attractive and interesting and contains an enormous amount of information. It is typical of the new spirit of experiment that has entered into biology, and will be of stimulating interest to a wide circle of readers of many kinds. It would be difficult to pick out examples in the short space of a review, but one of the things that delighted the reviewer was the account of the way in which an ant finds its way home by the sun. If, as in one experiment, the ant was imprisoned for two and a half hours, when released it deviated from its path by an angle which was exactly that through which the sun had travelled during this period. One can get in this book the answers to questions on which every naturalist must have thought often.

The authors are to be warmly congratulated on a very scholarly production. They have included a good bibliography and author, systematic, and general indices, and the format is pleasing.

TECHNIQUE OF PSYCHO-ANALYSIS

An Investigation of the Technique of Psycho-Analysis. Edited by Edward Glover, M.D., with the assistance of Marjorie Brierley, M.B., B.Sc. Research Supplements to the *International Journal of Psycho-Analysis*, No. 4. (Pp. 188. 10s. 6d.) Published for the Institute of Psycho-Analysis by Baillière, Tindall and Cox. 1940.

This discussion on the technique of psycho-analysis, edited by Dr. Edward Glover, should dispel any lingering idea that the psycho-analyst regards himself as an impersonal veiled prophet, uttering ultimate truth. It is based on the replies of twenty-four practising psycho-analysts to a questionary, and it has yielded two outstanding results of interest to the general reader. The first is the great variety of method adopted, based on individual experience. If it is attributed to release from a compelling sense of loyalty to the founder of psycho-analysis by the death of Freud, the answer might be given that some of the quotations in this book date from 1933. Yet we feel that it would not be a complete answer, and we take it as a sign of vitality that the subject is not being crystallized into a creed as a tribute to an immortal memory. Emphasis is laid on the fact that whereas in former years the question was commonly put: "Do you know what Freud would do in the circumstances?" now it is urged that medical tradition has always granted equality of opinion to all legally qualified practitioners. Secondly, the analyst has become more acutely aware of the influence of the patient on himself, an influence which varies at different stages in the analysis. This shifting relativity between analyst and patient must demand both self-criticism and much tact on the part of the former.

There is an interesting discussion in the introductory chapter on the training of analysts, in which it is pointed out that in a sense this involves a return to the old apprentice system. Even so, a technique which can only be carried out in the presence of the two protagonists must be difficult to acquire. Critics have suggested that there can be no adequate scientific control of psycho-analysis until, for example, dictaphones or microphones are installed in the consulting-room. The obvious objection to this is that once the patient even suspects he has not the secrecy of the confessional his resistances may well become impenetrable. In all these circumstances a child-like wholesale and uncritical adoption by the candidate of the training analyst's method is difficult to avoid, however undesirable it may be.

We have dwelt on the chief points of interest to the profession in general. For the rest this appears to be a useful handbook for the guidance of the novice in the art, and to those who are anxious to know something of the craft of psycho-analysis.

SULPHONAMIDE CHEMOTHERAPY

Sulfanilamide, Sulfapyridine and Allied Compounds in Infections. By Maurice A. Schnitker, M.D. Edited by Henry A. Christian, M.D., LL.D., Sc.D. Reprinted from Oxford Loose-Leaf Medicine. (Pp. 72. 8s. 6d. net.) New York, London, and Toronto: Oxford University Press.

The third American book on sulphonamide chemotherapy which has come to our notice, Dr. Maurice A. Schnitker's *Sulfanilamide, Sulfapyridine and Allied Compounds in Infections*, is a relatively short practical manual, designed mainly for the guidance of clinicians who have been unable to keep pace with the development of this subject. The theoretical aspect is not altogether neglected, and it is interesting that the author takes the present and almost certainly correct view on the mode of action of sulphonamide compounds, although the work of Fildes and his collaborators, which affords more solid support for this view than any previous observations, was published too recently for mention. The somewhat sceptical attitude towards the local application of sulphanilamide represents a view current about a year ago; it is recommended that serum as well as chemotherapy should be used in cerebro-spinal fever, and asserted that sulphanilamide will not prevent recurrences of rheumatic fever. Any book compiled with time-consuming care on a subject undergoing such rapid development is bound to "date" in this way in places. Apart from a few such matters as these the instructions given are well informed as well as clear, and the practitioner will find it a useful work of reference. There is a bibliography containing 202 items. Although emphasis is rightly laid on the value of controlling treatment by frequent estimations of the drug concentration in the blood and urine, it is surely a counsel of perfection to suggest that only those with facilities for such work should employ this treatment. We cannot believe that this restriction would be acceptable even in the U.S.A., where these facilities are more frequent, and in this country the mere idea is ludicrous.

Notes on Books

A fourth edition of *Fevers and Fever Nursing*, by Miss EVELYN PEARCE, sister tutor to the Middlesex Hospital, has been published by Faber and Faber (6s.). Since the last edition appeared in 1934 there have been considerable advances in the treatment of infectious diseases, and the new volume therefore contains information on chemotherapy and additional notes on Vincent's angina, tonsillitis, dysentery (including infantile diarrhoeas, cholera, undulant fever, tuberculosis, typhus fever, trench fever, relapsing fever, tetanus, and plague). An appendix contains the questions set in the final State examinations in fevers and fever nursing during the past five years.

Dr. PAUL TITUS'S large book, *The Management of Obstetric Difficulties*, was noticed on its first appearance in a leading article in the *Journal* of May 1, 1937, under the heading "Difficult Midwifery." A second edition has now reached this country and is published here by Henry Kimpton at 50s. The author explains in his preface that many new things of importance have been included and many deletions have been made, the total length of the book being now increased by eighty-eight pages, and there are seventy-five new illustrations. This work has now become more of a textbook than was

originally intended, but it remains a reference book which any obstetrician might be glad to have on his consulting-room bookshelf.

The two volumes of model answers by Mr. MACPHAIL—*Model Answers for the Preliminary Nursing Examination* and *Mental Nursing Final Examination Questions and Answers*—were originally printed as one, and on the appearance of the third edition the opportunity of dividing them has been taken. Their popularity is the best assurance of their value. The "preliminary" volume may now appeal to candidates for general as well as mental nursing qualification. The questions have actually been set; the answers are as short as accurate answers could be. The author hopes to assist the nurse to conquer her natural inarticulateness and express her knowledge fluently on paper. He condemns the method of memorizing phrases parrot-fashion, but these books are rather a temptation to it. Students for other professions may well envy mental nurses the quality of their cram-books. On a couple of points of detail, the discoverer of the pancreatic islets was Langerhans, not "Langerhan," and it is more usual to speak of streptococcal than of "streptococci" serum. Both books are published by Faber and Faber and cost 5s. each.

Mr. GEORGE SAVA has already delighted medical and other readers several times with his many-coloured reflections on life, which he lives and savours to the full. In *Twice Round the Clock* (Faber and Faber, 8s. 6d.) he purports to chronicle an odd twenty-four hours in his life as a surgeon. Actually he does nothing of the sort. He takes September 3, 1939, as his specimen day, and paints a vivid, polychromatic composite picture in which his personal feelings and reminiscences are primary and explosive and the events merely triggers. He visits a Polynesian king, proposes marriage, removes a swallowed upper plate, runs over a tramp in the dark, dreams an air raid and on waking up is called to minister to the dream-patients, now the real victims of a road accident. He loses a mother and child in a confinement, and lies awake revolving memories of his native Russia before and after the revolution; and all through continues to vociferate and digress as only an extroverted Slav can. His writing is like the music of a Russian ballet or opera in its constantly changing colour and texture—a real treat if you do not mind being somewhat dazed and giddy most of the time.

Preparations and Appliances

A SIMPLIFIED BY-PASS CONTROL FOR CO_2 ABSORPTION

Drs. J. P. FRAULO and J. A. W. ROBINSON of the Horton Emergency Hospital, Surrey, write:

With a view to facilitating the technique of CO_2 absorption we have devised, made, and successfully applied a simplified form of by-pass control for use in conjunction with the Waters canister.

This form of control will be readily appreciated when the features claimed for it are considered. They are as follows: (1) Simplicity in operation. (2) Reduction of dead space to a minimum. (3) Low internal resistance. (4) Rapid and complete isolation of the Waters canister when desired. (5) Contents of the bag remain undisturbed when the patient breathes air. (6) The bag may be filled with any mixture before application to the patient. (7) Precision adjustment, which may be determined by the operator's sense of touch, is rendered easy when visual adjustment is either difficult or impossible. (8) Ease in dismantling for cleaning and greasing—though the drum cannot blow out with gas pressure. (9) Connexions for bag and canister are interchangeable, for use on either left or right of the patient's head. (10) One oxygen inlet only required to supply the patient, irrespective of the position of control. (11) The canister may be recharged during operation without losing the contents of the bag.

The control, which consists of a small metal cylinder containing a rotating drum, is attached direct to a face-piece. There are four outlets from the cylinder—one providing direct access to air, whilst the other three open into branch pipes as follows: (*a*) to a rebreathing bag; and (*b*) and (*c*) to the front and rear ends respectively of the Waters canister.

The internal rotating drum—the function of which is to cut out and into circuit as desired the three cylinder outlets referred to above—is closed at the top with a milled flange to facilitate rotation and is provided with an expiratory valve. An embossed arrow on top of the drum indicates with which of the three branch pipes the corresponding opening of the drum aligns. Thus the position of the drum can be determined by the sense of touch; and this is further facilitated

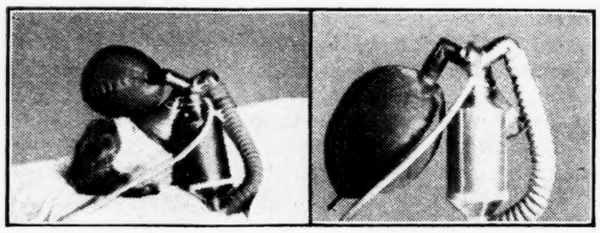


FIG. 1. FIG. 2.

FIG. 1.—Showing working position of apparatus. By applying it in this manner the weight of the canister helps to keep the instrument in place. The bag is here held up to make the face-piece visible.

FIG. 2.—Close-up view of the instrument in working position.

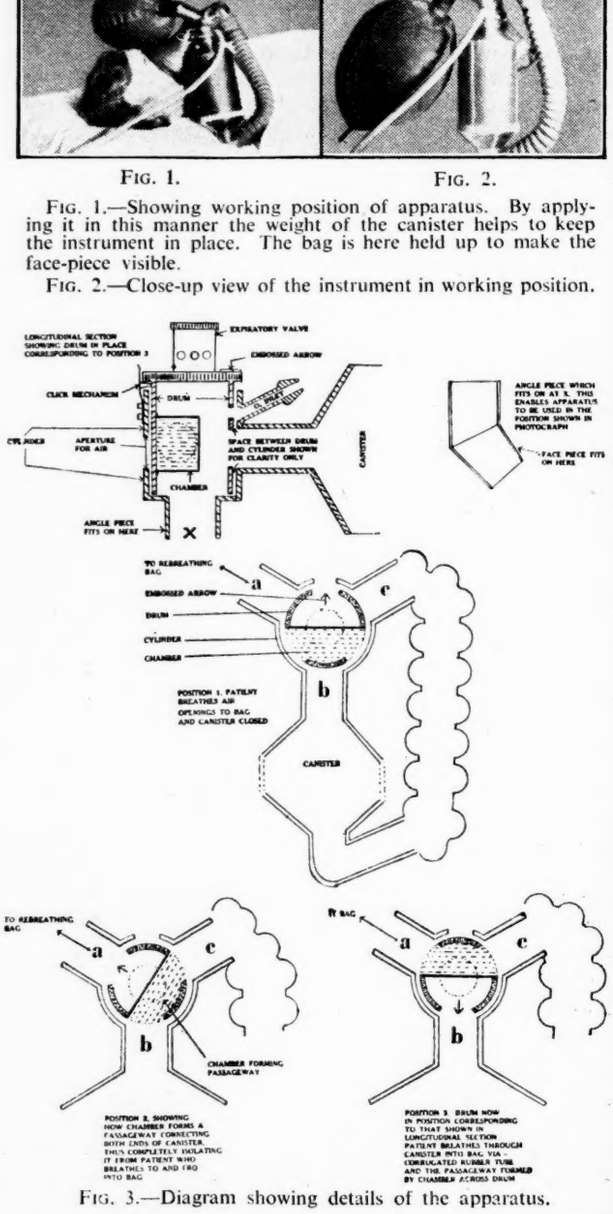

EXPIRATORY VALVE
EMBOSSED ARROW
CLICK MECHANISM
DRUM
CYLINDER
APERTURE FOR AIR
SPACE BETWEEN DRUM AND CYLINDER SHOWN FOR CLARITY ONLY
CANISTER
CHAMBER
ANGLE PIECE FITS ON HERE
ANGLE PIECE WHICH FITS ON AT X. THIS ENABLES APPARATUS TO BE USED IN THE POSITION SHOWN IN PHOTOGRAPH
FACE PIECE FITS ON HERE
TO REBREATHING BAG
a
c
b
POSITION 1. PATIENT BREATHES AIR OPENINGS TO BAG AND CANISTER CLOSED
CHAMBER FORMING PASSAGEWAY
POSITION 2. SHOWING HOW CHAMBER FORMS A PASSAGEWAY CONNECTING BOTH ENDS OF CANISTER THUS COMPLETELY ISOLATING IT FROM PATIENT WHO BREATHES TO AND FRO INTO BAG
POSITION 3. DRUM NOW IN POSITION CORRESPONDING TO THAT SHOWN IN LONGITUDINAL SECTION PATIENT BREATHES THROUGH CANISTER INTO BAG, VIA CORRUGATED RUBBER TUBE AND THE PASSAGEWAY FORMED BY CHAMBER ACROSS DRUM

FIG. 3.—Diagram showing details of the apparatus.

by a clicking mechanism which operates when an aperture of the drum reaches the desired position.

The rotation of the drum until a click is discerned brings the embossed arrow shown in the diagram, together with its corresponding opening, opposite to the outlet through which it is desired to direct the patient's breathing, whilst the two remaining openings are connected by means of a chamber inside the drum. The manipulation of the rotating drum in its cylinder thus results in the patient breathing one of three ways—namely, (1) air only; (2) in and out of the bag only; (3) to and from the bag via the Waters canister.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY NOVEMBER 30 1940

HEALTH PROBLEMS OF AIR RAIDS

The report of the Horder committee[1] is an excellent statement of the health problems raised by the crowding of people in air-raid shelters, and there will be general agreement with most of the measures it recommends for minimizing the dangers of infection. It cannot be too often repeated that the young children who have not yet become inured to endemic infections are at the greatest risk and that their evacuation from areas subject to nightly attack is the only satisfactory remedy; and that, short of evacuation, a properly constructed family shelter is the safest place for them, since the nasopharyngeal flora to which they are there nightly exposed is presumably that to which they have become accustomed in their homes. No means should be left untried for persuading parents to let their children leave the bombed cities. Even if this is achieved in considerable measure, the protection from disease of the adults and those children who remain is beset with very great practical difficulties. As the committee says, adequate sanitary equipment should be furnished in or adjacent to all communal shelters, large or small, which are occupied as sleeping places throughout the night, and it is obvious that it should be so situated as to be free from nuisance, so arranged as to avoid fouling of the floors and of the bedding and clothing of the occupants of the shelters, so supervised that these essential precautions are observed, and that it should be emptied and cleansed each day. These are elementary tenets of public health, but it is obvious that the placing in a proper position of such equipment in the smaller communal shelters cannot be arranged without some internal structural changes. If chemical closets are not available in sufficient numbers and dry pail closets have therefore to be used, it is desirable that separate receptacles should be provided for faeces and for urine, and that the former should be supplied with earth or sand to cover the dejecta after use. It may, however, be too much to expect a community accustomed to water-carriage to learn quickly how to use a conservancy system properly, and it may be impossible without something more than the appointment of the whole-time shelter marshals recommended by the committee. While such appointments are essential for the large shelters and probably to supervise a group of smaller shelters, part-time marshals selected from among those who frequent these shelters, and paid for their services, should be made responsible for the observance of decency and hygiene. The sanitary problem of large shelters is of a similar nature, but supervision should be easier to organize. As to the number of conveniences required there is no exact precedent, but the standard of one closet to every twenty inmates of a common lodging house is probably nearer the mark than one for twenty-five prescribed in factories by Regulations of the Home Secretary. Now that it is evident that communal shelters in large towns are not merely places of temporary resort, there can be no excuse for such neglect of elementary sanitation as might reverse the long history of decline in the alimentary infections. The risk of a sudden epidemic of these diseases from actual war damage to water mains is another question. It has been suggested that the positive pressure in water mains will militate against their contamination if they are damaged contemporaneously with rupture of an adjacent sewer, but infection of the mains occurs between the time of cutting off the supply and the completion of repair. Apparently in one town where this has occurred many of the inhabitants have not followed the advice to boil their water when the service was resumed. For this reason the case for anti-enteric inoculation is strong, although it will prevent only one group of diseases—the most important, it is true—conveyed in this way; we refer to this question on another page. To be really effective specific prophylaxis should anticipate the event. To wait for a major disaster before promoting it is bad preventive medicine. But inoculation should not be regarded as a substitute either for the constant hygienic care of shelters or for the most stringent cleansing and chlorination of water mains which have been damaged.

As the history of epidemics shows, the prevention of air-borne infection is a far more difficult problem, but the consequences of rapid and massive transmission of infection are so grave that every possible means should be tried to minimize them. The committee rightly points out that "it is utopian to expect that the standards of cubic air-space per person usually quoted can be fulfilled." Standards are, indeed, very variable. The most commonly quoted figure for general living purposes is 1,000 cub. ft. per person with ventilation providing three turn-overs of air per hour, but this volume has never been consistently attained in any type of building where people are gathered together, except hospitals. In army barracks at home 600 cub. ft. are allowed; in common lodging houses 400 cub. ft., which is also the modern allowance in factories. Residential school dormitories require 420 to 500 cub. ft. according to ventilation. On the other hand, where space is unavoidably restricted, as in ships, 120 cub. ft. are provided for white crews in sea-going vessels and 60 cub. ft. in canal boats (40 cub. ft. for children under 12), the latter being the lowest standard sanctioned by law. Adequate means of extract ventilation are available on ships, although they are not always properly used. The committee recommends that, for the present, 50 cub. ft. per person should be the standard for naturally ventilated shelters. It would be idle to pretend that this will give any security against infection. Indeed, it is inconceivable that any satisfactory measure of lateral spacing, which is even more important than the cubic volume of air allowed, is possible in the present exigency. Glover, in his calculation of the risk of cerebrospinal fever, defined severe overcrowding as a distance of less than 1 ft. between beds. Even twice this distance is not safe in the conditions of ill ventilation which obtain. The very difficult matter of venti-

[1] *British Medical Journal*, 1940, 2, 709.

lation must be quickly and energetically tackled by the responsible authorities, and it should be impressed upon shelter marshals that the maintenance of a current of fresh air is one of their first duties. Their task will not be easy in cold weather unless something better in the way of heating can be devised than the committee, no doubt after careful deliberation, has been able to suggest.

It is clear that safety in these circumstances cannot be attained by natural spacing. We must turn our minds to other means of breaking the chain of infection. One such means is what Wells has called "sanitary ventilation"—the destruction of micro-organisms in the air by measures which are not deleterious to those who breathe it. The committee refer only very briefly to the use of ultra-violet light which Wells had advocated, but they are probably right in concluding that its value under shelter conditions is problematical. The method, however, deserves concentrated trial in some types of shelter, since its advantages from the aesthetic point of view are great. Spraying with an aqueous solution of sodium hypochlorite is recommended. It will have the disadvantage of overloading with moisture an atmosphere already too humid. Atomization of small quantities of disinfectant in the form of aerosols would probably be better. If there is any shortage of suitable apparatus for this purpose the Government ought to take the matter in hand immediately. The committee also recommends tentatively a simple form of face-mask such as is used by surgeons. This is probably the surest means of preventing the dissemination of droplets which may either infect at short range or strike at a distance as droplet nuclei. To persuade, or indeed compel, shelter habituees to wear masks should not be impossible under present conditions; although they may well prove to be refractory to the suggestion. To provide masks and arrange for their cleansing and disinfection will be a large undertaking, but much less so than the alternative of admitting to hospital the volume of the sick which will result from neglect of all possible preventive measures.

For one disease at least—namely, diphtheria—specific prophylaxis should be extensively provided. Stocks has shown that the fall in notifications in 1939 and the present year has not been attended by anything like so great a decline of mortality in the large towns, and the danger of this fatal disease among young children which this winter's conditions will bring can definitely and easily be eliminated. From measles, too, the sting can be removed by timely use of adult serum for children known to have been exposed. It is understood that there are now fairly ample supplies of serum in the country. The health departments should also be ready to vaccinate large numbers of the community in the event of small-pox gaining a foothold.

INOCULATION AGAINST ENTERIC FEVER

About three months ago the official view as to the desirability of vaccination against enteric fever was expressed in a circular letter issued by Sir Arthur MacNalty, then Chief Medical Officer to the Ministry of Health. He advised against any immediate attempt to secure mass immunization of the population as a whole, but noted that immunization on an extensive scale might at any time become desirable in particular areas in the face of special risks. At the same time he advised that facilities for vaccination should be provided, so that those who wished to avail themselves of the protection which anti-typhoid vaccine affords should be able to do so. With this pronouncement few would have disagreed; but three months is a long time in war, and enough has happened since mid-August, in London and elsewhere, to justify second thoughts.

Has the risk of enteric infection increased since Sir Arthur's advice was given? So far as the war is concerned it has. Aerial bombardment on the scale of the past three months involves at least occasional damage to water mains and sewers, and the wise precaution taken by the Ministry of Health of extending chlorination to all public water supplies cannot avert the consequences of all possible mishaps between the reservoir and the household tap. More important, probably, is the menace of the shelters. It is not easy to improvise sanitary arrangements on an adequate scale in tubes, or in other underground retreats, that were constructed for quite different purposes. On the credit side of the account we might be tempted to enter the fact that we have passed through the dangerous autumn period without any disturbing events. If we were unwise enough to prophesy on peacetime experience we might well be tempted to write enteric fever off until next summer. But normal seasonal incidences are already among the war casualties, as is sufficiently illustrated by the fate of the measles curve. It would be as well to regard all things as possible while the population is crowding or dispersing on the present scale.

One thing is quite certain. The risk of any serious epidemic of enteric fever will be progressively reduced as the proportion of immunized persons increases. Apart from the possible toll in deaths, which may depend in large part on whether we are afflicted, if at all, with typhoid or with paratyphoid, the call on hospital beds will be a heavy one if many small or a few large epidemics occur. We should all feel at least a little more comfortable if over 80% of the civilian population, as well as of the Army, were protected against this particular infection; and there are not so many things we can do which will with certainty reduce an epidemic risk to minor proportions that one of them can be lightly neglected in the absence of firm assurance that the risk concerned is small.

At the moment there would probably be little dispute that the greatest risk that can beyond doubt be avoided by immunological methods is diphtheria, and that the most pressing need is therefore the immunization with toxoid of the largest possible proportion of our child population in the shortest possible time. So far as diphtheria is concerned the adult population can wait, as all but a small proportion of them have become naturally immune. The effort to do in a few weeks or months what we have neglected to do for more than fifteen years is likely to strain our resources, and it would probably be impossible, even if we wished it, to attempt mass immunization against diphtheria in children and against enteric in adults at the same time. The wisest plan may well be to underline Sir Arthur

MacNalty's second recommendation, and to encourage increasing numbers of persons to make use of the facilities for anti-typhoid inoculation that have already been provided. The example of Southampton shows that the response will not be negligible. Later it may be wise to increase the pace, and it must be remembered that at any moment we may have to attempt a large-scale attack in some particular area. There are, indeed, certain sections of the population who might even now be regarded as in a special category. Those members of the A.R.P. services who may have to work in close proximity to broken sewers are clearly exposed to a special risk. Workers in the armament factories are as essential to the war effort as are troops in training. If it is decided to pursue, at least for the next few months, a policy of gradualness in the anti-typhoid campaign, it would be wise to allot priorities It would be wise, too, perhaps to review the question of dosage. The conventional doses are based on experience in healthy young adults. In any wholesale immunization of the civilian population other classes will have to be included, and it might be well to determine, so far as it is possible by available tests, whether small doses would not induce an effective response. Though the average reaction produced is a trivial thing in comparison with the advantage gained, it would make things much easier if it could be reduced to negligible proportions, involving no interruption at all in full working capacity.

We have considered anti-typhoid and anti-diphtheria immunization as two different things, both desirable, but with very different degrees of urgency; but though they are different in kind there is no inescapable reason why they should be different in time. We can, if we choose, immunize simultaneously against both infections, either by combining the reagents, as has been done in France, or by giving two simultaneous inoculations. If, then, it is desired in the end to protect against both diseases, why not get the problem of the children settled as soon as may be by combining typhoid–paratyphoid inoculations with those of diphtheria toxoid? The only valid objection to this procedure would seem to be that giving two simultaneous injections might slow the pace of mass immunization or lessen the proportion of parental consents so that there was an avoidable delay in raising the proportion of diphtheria immunization among the child population as a whole above the level at which epidemics cease to occur, or that an increased reaction resulting from a single combined inoculation might produce the same result. Because of this possibility the advantage of the combined method is debatable, but it remains worth debating.

EFFORT SYNDROME

Effort syndrome is the name given to a collection of cases in which exercise is limited, often to a severe degree, by breathlessness, palpitations, precordial pain, giddiness, and exhaustion, and in which organic heart disease is commonly absent or, if present, is too slight to account for the symptoms. The condition is common enough in civilian practice, but in war it becomes of outstanding importance. Figures given by Sir Thomas Lewis[1] from the last war make this clear. By the summer of 1918 no fewer than 70,000 men from the British Army had reported sick and been classed as cardiovascular cases; of these only one-sixth had organic heart disease, the remainder had effort syndrome, and of such cases 44,000 became pensioners. Among cases seen in the first two years of the war 43% had symptoms on enlistment; these men had been trained for an average of 6.1 months and had spent 5.2 months in hospital. Even in 1918, when treated by the most effective methods then devised, only 34% of cases were returned to full duty, while 18% were discharged as permanently unfit. From the point of view both of conserving man-power and of saving the Exchequer important sums in hospital treatment and in pensions, it was evident that effort syndrome would prove again to be an urgent problem in the present struggle. Although no figures are yet available, every indication is that this expectation will be fulfilled. The problem has many aspects. In our present issue we publish two papers which are concerned with what may be called the physiological disturbance underlying effort syndrome. Dr. Spillane's observations are chiefly directed to the circulatory disturbances. His figures show that, unlike the rather similar disturbances of thyrotoxicosis, there is no increase in the velocity at which blood traverses the circulation in effort syndrome at rest or, compared with the normal, after exercise. In view of the small and inconsistent decreases in circulation time after exercise, these experiments do not preclude the possibility that cardiac output after exercise in patients with effort syndrome deviates from the normal, and it is still desirable that estimations of cardiac output should be made. Dr. Guttmann and Dr. Maxwell Jones investigate the hypothesis that the symptoms of effort syndrome are primarily the result of overbreathing. By voluntary overbreathing symptoms were produced in only 50% of cases, and these were symptoms commonly associated with tetany; the more characteristic symptoms of effort syndrome, in particular palpitations and precordial pain, were never or rarely reproduced. They conclude, therefore, that the symptoms of effort syndrome are not the result of overbreathing.

It is encouraging to note that observations along these lines are being made, for an understanding of the exact nature of the physical disorder may at any moment illumine the more practical aspects concerned with its causation and treatment. The present position is very largely that achieved at the end of the last war by the painstaking efforts of Lewis and his colleagues. They showed that the onset of effort syndrome frequently pre-dates enlistment, and that it is particularly apt to develop in those previously living a sedentary life or recovering from infection. These are, of course, precisely the circumstances which, in anyone, will lead to symptoms on effort. But whereas in healthy subjects exercise tolerance improves, in effort syndrome it usually does not. A second point noted by Lewis and his colleagues was that the personal habits in patients with effort syndrome are abnormal, at all events in soldiers, for an unusual number are abstainers or non-smokers, and the incidence of exposure to venereal disease is low. So the

[1] *The Soldier's Heart and the Effort Syndrome*, London, 1940.

conception has been formed that effort syndrome is in many instances an expression of a psychological disturbance, a hypothesis which we may hope the war will prove or disprove.

One of the most unfortunate features in the history of effort syndrome is its nomenclature. It has been called "irritable heart," "soldier's heart," "disordered action of the heart," "athlete's heart," and "heart strain." If we consult our textbooks we find it described under diseases of the heart. Consciously or unconsciously the average doctor associates it with a disorder of this organ. Whatever else it may be, this in essence it is not: the heart at necropsy is anatomically normal, and in Grant's series[2] of 600 cases followed for five years the incidence of definite cardiac disease was only 1%. Lewis showed that the condition is aggravated by rest in bed, and it is generally believed that the patient deteriorates the more doctors he sees and the more often his heart is examined. These points are important, for cases are still being labelled D.A.H., still found lying in bed, and still being shuffled about from one doctor and one institution to another. The conviction grows that in the genesis of this condition the doctor who is obsessed with heart disease is at least one important factor. These cases, then, should be diagnosed at once and the patient should immediately be informed that there is nothing wrong with his heart. Treatment should be instituted without delay by means of graduated exercises in an institution equipped for the purpose. These are the methods found most successful in the last war. But, as already mentioned, they are not completely successful, and there is scope for new approaches to the subject in the present war. Finally, in view of their poor response to treatment, the question arises whether men who have already developed effort syndrome should be excluded from the Army.

THE BACTERIOLOGY OF RHEUMATIC FEVER

Modern studies have tended more and more clearly to incriminate haemolytic streptococci as causal agents in rheumatic fever. The close association between streptococcal pharyngitis and exacerbations of the disease, the exaggerated and persistent production in rheumatic subjects of antibodies to streptococcus toxins, and, perhaps we may now add, the freedom from attacks which accompanies prolonged sulphanilamide treatment, all point to the haemolytic streptococcus in the throat as an essential factor in aetiology. More than that no one can say, as it is far from clear why a simple catarrh of a mucous surface should have such disastrous and distant effects. It has been generally agreed that some other factor must also be at work and that the alternatives are a coincident infection by some other micro-organism such as a virus, or a state of hypersensitiveness to streptococcal products. Very few people have seriously believed in a third and more simple alternative—namely, that all the manifestations of rheumatic fever are due directly to the presence of haemolytic streptococci in the lesions themselves. Nevertheless, a startling announcement made by C. A. Green last year raised this possibility anew: by the use of a special medium he was able to cultivate haemolytic streptococci from affected heart valves post mortem in cases of active rheumatism; these streptococci were positively identifiable by Griffith typing with those found in the throat during life, and they were not recoverable post mortem from the blood—a fact which argued infection of the valve and not a mere terminal bacteriaemia. This study has been pursued in Edinburgh by S. Thomson and J. Innes, whose findings in ten further cases are fully described on page 733. Substantially they confirm Green's observations: haemolytic streptococci were cultivated from heart valves in five out of ten cases of rheumatic fever, and in none of twelve control cases of patients dying of other conditions. On the other hand bacteria of other types were found with similar frequency: in four cases there were coliform bacilli, in four non-haemolytic streptococci, and in one a pneumococcus. The former can only have come from the lower bowel; the two latter were almost certainly derived from the mouth or throat, and presumably represent an agonal infection. It is worthy of remark in passing that earlier observations in which streptococci other than *S. pyogenes* have been cultivated post mortem from rheumatic lesions are possibly explicable in this way. This frequent occurrence of what is apparently a purely terminal bacteriaemia does not detract from the significance of finding haemolytic streptococci in cultures from the heart valves, provided that these organisms were not also in the blood. In two cases, however, they were also cultivated from the blood and in a third from the spleen; hence only two cases out of ten remain in which the evidence of valve infection is as complete as this form of study can make it.

It is clearly the duty of everyone in a position to do so to extend these observations until results are available on a much larger scale. In the meanwhile we may well reflect on the position which would be reached if Green's findings were extensively confirmed. It would then be necessary to explain why haemolytic streptococci finding lodgment in a heart valve can produce either of two totally different conditions—a small platelet thrombus in which no micro-organisms are convincingly demonstrable, persisting for months and ultimately undergoing fibrosis; and, on the other hand, the vegetations loaded with masses of bacteria which used to develop in prolonged cases of streptococcal septicaemia. Another difficulty is that these organisms are apparently not demonstrable in the joint lesions, although these are of essentially the same nature as those in the heart. If rheumatic fever is in fact the result of bacterial activity in the lesions themselves, it differs profoundly from all other streptococcal infections, and, indeed, from other well-understood infections of whatever kind.

[2] *Heart*, 1925, **12**, 121.

LIGHTING IN FACTORIES

No more important factor in the working of our national industries can be conceived in these days than that of lighting, and the recent new draft rules and regulations on this subject issued by the Ministry of Labour and National Service are therefore to be welcomed. An explanatory memorandum, which has been sent to all employers, rightly states: "Experience shows that marked increases in production, as well as a reduced risk of accident and overstrain, have resulted from improvements in the lighting arrangements; and the Minister is advised that although there has been widespread improvement in factory lighting in recent years there are still many factories, including many engaged on work important for the prosecution of the war, in which the lighting is still unsatisfactory, either in amount or in the arrangement and shading of the lights." The regulations provide that light should be not less than 6 foot-candles measured in the

horizontal plane at a level of three feet above the floor. If there are difficulties in getting this general and uniform lighting then there should be 2 foot-candles at this level, but where work is actually being done the illumination should not be less than 6 foot-candles. All other interior parts of a factory should have a light of not less than 0.5 foot-candles on floor level. To prevent glare where parts of a factory should have a light of not less than sixteen feet above floor level no part of the source or of the light fitting, having a brightness greater than 10 candles per square inch, should be visible to persons while normally employed within 100 feet of the source, except when the angle of elevation from the eye to the source, or part of the fitting as the case may be, exceeds 20 degrees. Suitable shades on lights over benches should be provided, and effective measures should be taken to prevent discomfort or injury from light reflected from smooth or polished surfaces into the eyes of the worker. Shadows are dangerous, the memorandum continues, and care must be taken to guard against them. A series of tables are included in the memorandum whereby the candle-power of electric lights of different powers and at different distances can be calculated. This, however, cannot be done with gas lighting, so that the help of the supply undertaking must be obtained. Factory owners should have been advised to get a photometer. There are good electric instruments to be had, and even the older, candle-equipped ones which were used in school work would make the work of measurement easy and accurate.

VITAMIN P IN PURPURA

Capillary tonus may be decreased in vascular haemorrhagic diseases as a result of trauma, pressure, avitaminosis, bacterial invasion, chemical injury, or lymphatic infiltration. Kugelmass[1] has been successful in treating several of these conditions with a solution containing 50 mg. of flavanones (eriodictyol glucoside and hesperidin) per c.cm. prepared by Szent-Györgyi's method.[2] The dose was 150 mg. given daily by mouth. A boy of 5 months weighing 6½ lb. improved slightly with blood transfusion and lactic acid milk, but very rapidly on receiving the vitamin P mixture. A girl of 10 years with allergic constitution, high fever, recurrent chills, abdominal pain, and bloody stools responded slightly to calcium gluconate, rapidly to vitamin P, relapsed when vitamin P was withheld, and improved once more when it was given again. A girl of 15 years, allergic, with recurrent cutaneous haemorrhages associated with nose-bleeding, high fever, occasional chills, abdominal pain, and persistent diarrhoea, was relieved by the elimination of the allergens, but the purpuric manifestations continued. Sulphanilamide produced some improvement, but vitamin P was very much more effective. A girl of 9 years had abdominal pain, high fever, and purpura over the lower extremities within a week of recovery from scarlet fever. The purpura spread, but there was no haematuria despite the destructive effect of scarlet fever toxin on the glomerular endothelium. Vitamin P was given and there was rapid improvement; it was then withheld and a relapse followed. Vitamin P was again given and there was a similar improvement. The whole process was repeated again with similar results. The duration of each of the treatments was five or ten days. Patients suffering from mechanical purpura were not benefited by vitamin P therapy. A nine-year-old boy who had developed petechiae in the conjunctivae and eyelids during whooping-cough, a sixteen-year-old boy mentally retarded with epilepsy and showing purpuric extravasations following severe seizures after water-guzzling bouts during a ketogenic regimen, a ten-year-old girl with Perthes' disease and orthostatic purpura when plaster-of Paris casts were removed—all failed to respond to daily doses of vitamin P.

[1] *J. Amer. med. Ass.*, 1940, **115**, 519.
[2] *Hoppe-Seyl. Z.*, 1938, **255**, 126.

THE ORIGIN OF ACTINOMYCOSIS

There can be few who still accept the old idea that actinomycosis results from chewing straw or grain. This arose from a confusion between two plainly distinct micro-organisms, of which that found in grain, originally by Bostroem, has no claim whatever to be considered pathogenic for man. It is generally concluded that the infection is at least usually autogenous, and micro-organisms of this nature are known to exist in the mouth, tonsils, and lower bowel, but owing to technical difficulties they have not often been isolated from such sources and still less have they been adequately studied. H. R. Sullivan and N. E. Goldsworthy[1] report an attempt to isolate the organism from periodontal pockets in patients not suffering from actinomycosis; they were successful in five cases out of over one hundred, and in one other case they obtained a strain from a carious tooth. These six strains were carefully compared with others derived from actinomycotic lesions of the jaw, and in morphology, cultural characters, and fermentative reactions no difference between the two groups was observed. These authors frequently obtained a history of dental extraction immediately preceding the onset of actinomycosis of the jaw, and regard trauma as a frequent additional factor accounting for the onset of the disease in this situation. We recently[2] drew attention to Erikson's study of anaerobic *Actinomyces*, an important result of which has been to show that strains of human origin are antigenically quite distinct from those of bovine. This observation appears to sever any connexion which may have been supposed to exist between the human disease and that occurring in cattle, and we would refer again to the proposal that the name *A. bovis* should be retained for the species found in cattle and *A. israeli* (or possibly *A. hominis*) for that peculiar to man.

[1] *J. Path. Bact.*, 1940, **51**, 253.
[2] *British Medical Journal*, 1940, **2**, 90.

MR. ERIC GILL AND THE "JOURNAL"

Mr. Eric Gill, who died on November 16, was familiar to many readers as a sculptor, engraver, and designer of type faces. The light-faced type—Perpetua—on the cover of the *Journal*, and the device in red, were both the work of his hand. When the new cover first appeared in our issue of January 2, 1937, it was thought that many readers would criticize the substitution of Mr. Gill's device for what one critic described as "Sir Charles Hastings's picturesque and dignified head." But his was the only discordant note in a chorus of praise that was as flattering as it was unexpected. The four years that have almost passed have fixed Mr. Gill's beautiful design firmly in our affections and admiration.

We regret to announce the death on November 25, aged 81, of Colonel Thomas Sinclair, C.B., M.D., F.R.C.S., M.P. for Queen's University, Belfast, from 1923 until September, 1940. We hope to publish a memoir in our next issue.

A MOBILE OPERATING THEATRE

BY

R. J. WILLAN, M.V.O., O.B.E., F.R.C.S.

Professor of Surgery, Durham University

A mobile operating theatre appealed to me as being invaluable for use in outlying districts for certain types of air war casualties requiring immediate operation, where harm would result from previous transport; in dealing with minor casualties, the nursing of which could be done at home, thus saving hospital beds for more urgent cases; and to supplement theatre accommodation in a hospital where a number of cases required immediate operation.

Finding a Suitable Vehicle

With official encouragement I explored the possibilities of acquiring some suitable vehicle that could be converted into a theatre. A visit to the Northern General Transport Company at Gateshead was fruitful, for I was shown a single-decker bus which happened to be stripped of its inside seating accommodation. A portable operating table was taken inside the vehicle, which proved that there was ample room for a surgeon and his assistant to work in. I was advised not to have a double-decker bus because its height would limit the roads which could be used.

An inquiry for the purpose of utilizing previous experience in the fitting out of a mobile theatre failed to discover the existence of a similar one. I was able, however, to use experience gained when faced with a similar problem in the fitment of operating theatres in a naval hospital ship in August, 1914 (Willan, 1915).

Problems to be Solved

As the theatre would have to be self-contained the problems to solve included the provision of a water supply, water heating, heating of an instrument sterilizer, ventilation, lighting (including emergency lighting), maintenance of the electric accumulators, provision for bowl sterilization, provision of shelves and adequate cupboards, and care of the anaesthetized patient after the operation. The necessity for economizing space had always to be kept in mind. Things were simplified by the knowledge that lack of space precluded any attempt at operating with a dry aseptic technique. There could be no room for a multiplicity of containers holding sterile gowns, towels, mackintosh sheeting, aprons, etc. Only an antiseptic technique could be provided for, although it should be emphasized that any kind of major emergency operation could be done. The question of replacing the rear end with new wide doors to facilitate ingress and egress of patients was considered, but it was found that the existing door was wide enough to admit an ambulance stretcher, and that larger doors would unduly lower the inside temperature.

The Equipment

Various methods of heating for the water and the instrument sterilizer were considered: ultimately an idea of using compressed "gas" was discarded because it was thought unwise to have any cylinders in the confined space, and a similar reason precluded the use of a high-pressure oil stove. No special apparatus for heating the vehicle was necessary, as the water heater and the instrument sterilizer were more than sufficient. To conserve space the tables, with one exception, are hinged, the exception being a fixed shelf for the anaesthetist. Bowls are sterilized by continued immersion in a hinged lidded tank filled with a 1 in 20 solution of carbolic acid.

Various types of lights, including the side-lights of a motor-car, were tried out for the main operating lights, the difficulty being the intense heat generated so close to the surgeon's head. Supplemented by two portable spot-lights, the lighting is admirable, the accumulators being effective for four hours without recharging. There are two sources of electric light—one from the accumulator and the other from the engine and dynamo. Ordinarily the accumulators are charged by the engine dynamo, but in garage they are kept charged by periodic plugging into an electric-light socket.

Previous experience had shown me that an anaesthetized patient cannot be transported from a hot theatre through the open air without risk of chest complications. The portable canopy was devised to avoid this. When in use the theatre is backed up to a doorway so that the patient can be transported direct into a house; alternatively he can be carried straight into the ambulance.

Description of the Theatre

The mobile operating theatre was converted from an A.E.C. Reliance single-decker omnibus with a six-cylinder 80-h.p. petrol engine and a petrol tank of 40 gallons. It is a 32-seater public service type, constructed of English ash and oak and reinforced by steel plates. Access is by a 2 ft. 6 in. folding door situated at the front end, and there is an additional emergency exit 2 ft. 3 in. wide at the rear: these doors have not been altered in any way. The internal dimensions of the body are: 21 ft. long, 6 ft. 9 in. wide, and 6 ft. high. It is fitted with six wheels, the rear wheels being doubled.

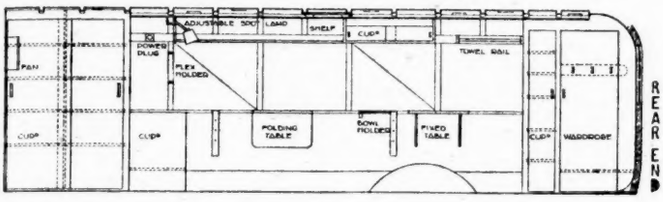
The fittings, which are all drawn to scale, are shown in the diagrams. Only certain of these fittings will be commented on. The floor is covered with heavy brown battleship linoleum, all corners being rounded off to obviate collections of debris. On the floor a rectangular copper bowl sterilizer 2 ft. 6 in. by 14 in. by 11½ in. is fitted on the portion of the wheel which projects into the body on the near side; it is provided with a special moulding in the interior to prevent the carbolic fluid from spilling during transit, and the lid is hinged. Four air-vac ventilators of the extractor type are fitted into the roof at regular intervals, these being supplemented by a ventilator of the letter-box type situated in the dome panel above the water heater and also by an electric fan.

The sink and its two associated cupboards come to the level of the sill. The first cupboard is divided into two parts; the top part, closed and provided with a bottom-hung door, contains the instrument sterilizer. The sterilizer, a chromium-plated copper box, has a removable tray for lifting out the instruments, and its dimensions are 14 in. by 10 in. by 6 in. The lower part of the cupboard, which is open and terminates at the cove, provides accommodation for a paraffin lamp of 150-candle power for the instrument sterilizer. The sink itself is 16 in. by 13 in. by 7½ in. internally, the waste pipe being suitably trapped and passing through the floor of the vehicle. The space under the sink forms a cupboard to store the metal stand, measuring 15 in. by 11 in. by 9 in., which holds the instrument sterilizer. When in use the sterilizer is set up on the draining-board formed by the top of the cupboard, this being fitted with hardwood fillets to hold the stand in place. The second cupboard is also divided into two portions: the open upper part contains the 300-candle-power paraffin lamp which heats the boiler, and is fitted with a metal flue by which the fumes may be conveyed through the roof; the lower half, which also has a bottom-hung door, provides storage for a paraffin-oil drum. On the top of this cupboard is fixed a copper cylinder of 5 gallons capacity which is insulated to retain the heat; it supplies the hot water to the sink for washing-up purposes, etc. A pipe from the cylinder leading through the roof serves as an escape vent for steam.

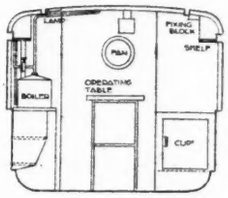
Cold water is obtained by gravity from a tank of 50 gallons capacity stored under the canopy adjoining the driver's seat. From this storage tank one pipe leads to the sink and another to the boiler, both pipes being fitted with stopcocks. The two apertures behind the sink and the cylinders are lined with metal sheeting.

On the exterior of the vehicle a steel ladder fixed adjacent to the front entrance door gives access to an aperture in the roof whereby the water tank can be filled; a float projecting through this aperture indicates the level of the water. Inside the tank are fixed perforated copper baffle plates to steady the contents when negotiating corners during transit.

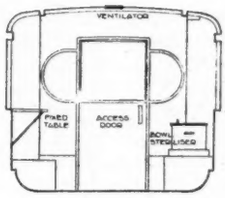
A large dual cupboard at the front on the off side has sliding doors; in it are kept dressings, instruments, splints, lotions, etc. Near the roof on each side are shelves, with sliding doors, for storing ligature material, gauze jars, etc. Apart from those having sliding doors, all cupboards and wardrobes are fitted with outward-opening doors with suitable latches.



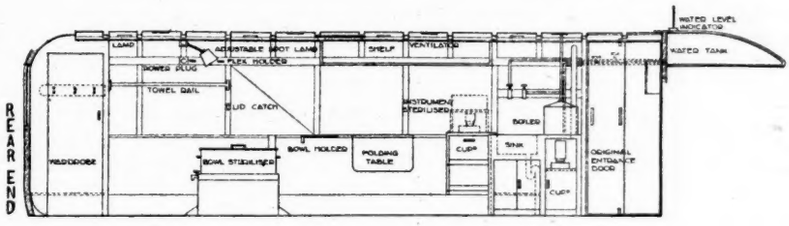
OFF SIDE



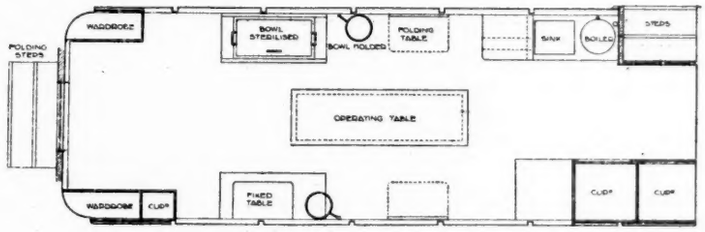
FRONT END



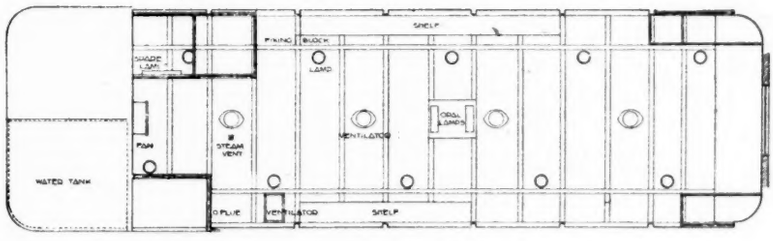
REAR END



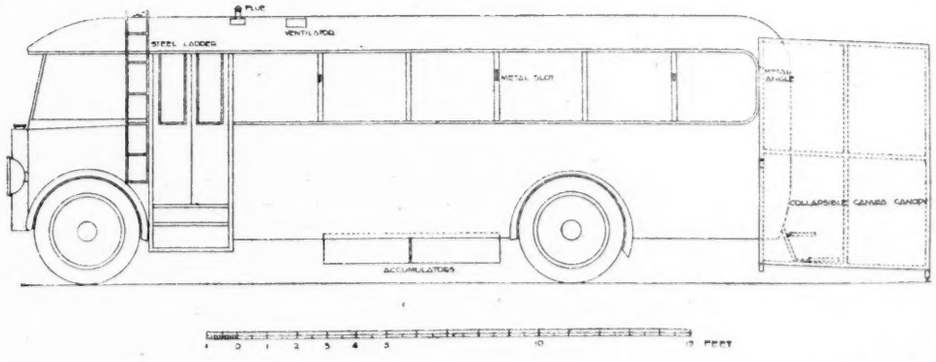
NEAR SIDE



FLOOR PLAN



CEILING PLAN



The general lighting consists of two banks of lamps running down each side of the roof. Each bank consists of five round semi-flush unenclosed lamps fitted with one 12-V 12-W gas-filled bulb. The intense lighting over the operating table is obtained from two totally enclosed circular opal lamps each fitted with two 12-V 60-W bulbs. These operating lights are assisted by two portable adjustable spot-lights which can be clamped to any projection on roof or side as desired; one 12-V 24-W bulb is fitted to each. Underneath the off side of the body a large wooden crate accommodates the accumulators. The whole of the interior is finished in white enamel, whilst the outside is in dark tarmac grey with a matt finish.

To obviate carrying an unconscious person through the cold air from the theatre a collapsible canvas canopy is erected at the rear end of the vehicle. The wooden frame for the canopy, when attached to the metal angles fitted to the theatre about 1 foot from the end, projects approximately 5 feet back and is then covered over with canvas. The canopy in no way interferes with the opening or closing of the door. When not in use the canvas is detached from the wooden frame and stored inside; the frame itself—of thin woodwork—is folded up, and its several parts are strapped to the metal slots fixed along each side of the vehicle. Two wide and very strong steps are fitted directly below the emergency door; when folded up they may be locked, and they also lock the

emergency door at the same time. The door at the front of the vehicle is secured by a bolt from the inside.

Inauguration of the Mobile Theatre

Through the generosity of the directors of the transport company the bus was donated—a valuable gift, for it is in excellent condition. The fitting out of the theatre was admirably done at short notice by Northern Coachbuilders, Ltd., Newcastle-upon-Tyne.

The mobile theatre is the property of the Northumberland Branch of the British Red Cross Society, which has loaned it to the Ministry of Health for use anywhere in the Northern Region during the war. After the war it is proposed to use it in outlying districts for minor operations—cases which can be nursed at home.

At a ceremony in Newcastle on October 12, 1940, the Countess Grey, C.B.E., president of the Northumberland Branch of the B.R.C.S., accepted the omnibus from Mr. H. G. Stagg, representing the Northern General Transport Company; and a cheque to cover the cost of the interior fittings was received from Mr. Sam Smith—also a most generous gift. The theatre was then dedicated by the Lord Bishop of Newcastle, and "opened" by Sir Cuthbert Wallace on behalf of the Director-General of the Ministry of Health Medical Service. It is based on the Stannington (Orthopaedic) E.M.S. Hospital, and is staffed from there. It is always ready for service at short notice. The staff consists of a surgeon, anaesthetist, assistant, and a theatre nurse. The illustrations of the theatre, which are to scale, are self-explanatory. I am indebted to Mr. K. L. Rodham, B.Arch., for these drawings.

Thanks to the interest of the Countess Grey, a large motor ambulance, to take four stretcher cases, also became available. This ambulance is not to be detached for any other duty: it is housed with the mobile theatre, and they are to work together as one unit. Like the theatre, it will have its own crew and will always be available at short notice.

REFERENCE

Willan, R. J. (1915). *J. roy. nav. med. Serv.*, **1**, 412.

THE TREATMENT OF BURNS

TANNIC ACID VERSUS SALINE

BY

SOL. M. COHEN, M.A., F.R.C.S.

Surgeon, E.M.S.

On October 2, 1940, the following circular was issued by the E.M.S.

"TREATMENT OF BURNS BY TANNIC ACID

"Further experience in the treatment of burns has proved conclusively that the use of tannic acid on the hands, especially the fingers, is followed by disastrous crippling in burns of the second and third degree. Instructions in E.M.S./Gen./325 are to be amended accordingly and treatment with saline packs or arm baths will be substituted.

"In burns of the hands and/or fingers of the second and third degree, initial treatment should be confined to saline compresses or intermittent saline baths for at least one week, or until the oedema has subsided and sepsis has been controlled.

"If coagulation methods are then deemed advisable, the hands and fingers should be treated with gentian violet or triple dye, reinforced when necessary with a thin layer of sterile gauze. This dressing should be applied so that only a partial casing is produced—for example, on the back and front, but not the sides, of the fingers. Under no circumstances should a complete casing be applied."

Not a paper or a note had been published in any general medical journal either proving or even discussing what to me seems a retrogressive step in the treatment of burns. It is my contention that a large number of surgeons of experience are of the same opinion. Before we are compelled to succumb to this "dull uniformity in mischief" it is my contention that the basic facts justifying this order should have the sanction and agreement of the medical profession.

Criticism of Tannic Acid

First the use of tannic acid in burns of the hands and fingers is vilified; now it is being condemned for the face. The public, A.R.P. personnel, the nursing staff, the soldier, and even the doctor have all been taught that tannic acid jelly is the best first-aid treatment of burns. To condemn it now—unless it is proved to be deleterious—would be to create confusion. Wilson, Underhill, and others have shown that it is not sepsis, "toxins," or the absorption of broken-down proteins that accounts for the shock and toxaemia of burns. It is loss of serum, and Prof. Wilson quotes Underhill as being of the opinion that no absorption, only excretion, takes place for the first forty hours after the burn. The importance of sealing off this loss by tan is so well recognized that to plead for its continued use seems absurd. But it is to be admitted that the circular speaks only of burns of the hands and fingers.

For Local Treatment

I agree that there are many apparent disadvantages about the tannic acid coagulum treatment—the mess, the stained linen, the tedious spraying, and often the burns received from the drying hot cradle. In many cases the tan became infected, first, because the initial cleansing treatment had been inadequate, and, secondly, because the tanned areas were allowed to roll unbandaged among the blankets. The recent work of van den Ende and others[1] has shown that these simply teem with streptococci. To allow the limbs to remain in contact with them is therefore to invite infection. In a recent paper in the *Journal*[2] I stressed the importance of covering the burnt areas and of elevating the limbs to assist the return of the serum extruded into the tissues. I emphasized that to prevent infection in burns of the face and forehead it was important to shave the hair well back. I can say with MacCollum[3] of Harvard that "infection is not the normal sequence of the tannic acid treatment of burns."

The Americans have long used the silver nitrate–tannic acid coagulum as introduced by Bettman and are enthusiastic about it. In war burns it is of great advantage as it disposes of the difficulties of handling the patient during the first twenty-four hours. It is applied in the theatre, the coagulum is immediate, and the "burn wounds" can be dressed with dry gauze. A mortality figure of 1.7% in 456 burns in children treated by the tannic acid–silver nitrate coagulum, given by MacCollum, "does its own shouting." Using 5% tannic acid and 10% silver nitrate solutions, the thickness of the scab is 6/1000 of an inch. And that is supposed "conclusively" to cause "disastrous crippling" of the hands and gangrene of the fingers. Well, I don't believe it. In a large experience of tanned war burns I have had only one case where this happened. I reported this case, and commented that at the time of the initial cleaning a poor result was inevitable because of the "roast pork"-like fingers. It is a fundamental principle in surgery not to make a dry gangrene moist.

In many of the war burns the patient puts his hands up to shield his face and the prominent knuckles or the first interphalangeal joints—just as the projecting ears—catch the maximum burn. The joints are opened, but this only becomes apparent when the sloughs separate, and it accounts for stiff joints in some of the fingers. There is often an over-granulated area at this site. It resembles, but it is not, as is being claimed, due to, pressure of the tan. The tan is thin, pliable; you can stretch it with your fingers. The thinnest layer of pus lifts it with ease and there is no throbbing, as there would be if it was under tension. If the affected area swells the tan "gives" with the oedema. This can readily be shown by inspect-

[1] *Lancet*, 1940, **2**, 133.
[2] *British Medical Journal*, 1940, **2**, 251.
[3] *Amer. J. Surg.*, 1938, **39**, 275.

ing a tanned surface. In a few days the tan has wrinkles or bulges, as with the subsidence of the oedema it is now too large for the reduced area.

Constriction of the arterial blood supply is exquisite agony. And yet our experience in a large number of tanned hands has been that it is exceptional to have to repeat morphine after the initial cleaning. The burn, if deep, involves the tendon sheath, and this results in the final fixation not only of the local burned area but of the whole of that finger.

Results

Since the *Blitzkrieg* started—that is, in seven months—we have had admitted into this hospital 112 burns, in seventy-eight of which there was some involvement of the hands and fingers. Really to appreciate these figures it must be remembered that in most cases both hands were involved. Only two of the men can never be soldiers again. In one case there is permanent complete crippling of the hand with loss of fingers and stiffness. In another there is no loss of fingers, but interphalangeal joint infection has put him out of the fighting line; nevertheless he can use his hands to eat, write, and earn his living. As coagulation methods had been employed in practically all these cases the results obviously indicate that it is not a "crippling" procedure.

It is now being urged that the use of tannic acid for face burns should be abandoned because of the dangers of corneal ulceration and permanent damage to the eye. We have had seventy-seven cases of face burns and they were practically all treated by coagulation methods. Our ophthalmologist—Mr. Medlycott—sees all our cases of burns of the face, and I have had it confirmed by him that in only one was there some slight corneal ulceration, which rapidly healed. The aesthetic appearance, with silver nitrate tan especially, has been most gratifying, and only two cases required skin grafting.

We blame the cleaning, the tan, the treatment, for the mutilated burnt hands, and forget that if the initial burn has destroyed the fingers and the tendons all the skill of the surgeon cannot restore their function.

Saline Baths

In war I do not consider saline baths to be practicable. The casualties are admitted in large batches; the wards are full; and the nursing staff just have not the time to attend to the details of the brine bath. The patients are being shifted from hospital to hospital, from wards to cover points, and the baths cannot be taken along with them. With forearms and hands in the baths it is difficult to give intravenous fluids, and at the same time the loss of fluid is not being checked. To do frequent dressings is to invite infection.

Saline baths have two duties to perform—(*a*) to deal with infection; (*b*) to expedite the separation of the dead sloughing tissues so as to permit of early skin grafting. With the evacuation from Dunkirk we had a large number of foul late wounds to deal with, and "unassisted" Nature, boxed up in plaster with her enemies, dealt most ably and firmly with them. As under the plaster so under the tan can she deal adequately with infection. Atkins,[1] in an article entitled "Lessons from Dover," where he had much experience in war burns, showed that the tan may be safely left—it doesn't affect the pulse or temperature. And he regarded what he termed the "tannic acid pus bag" as of advantage.

In a large number of wounds treated by the closed plaster method I have been impressed with the speed with which "unassisted" Nature does her own separation and cleaning. The proteolytic action of pus is considerable, and it plays an important part in separating and clearing the sloughs. At the end of a month, at the most six weeks, the deeper burn sloughs should have separated. The patient is fit, the wound is clean to the eye, but organisms may still be present. It is at this late stage of the treatment of deep burns that I think saline baths can play an important part—the stage when the sloughs are gone and organisms may still be battering against impermeable granulations. To deposit the skin graft amid such infection, however mild, is to court failure. The running stream will clean anything. The surgeon's hands that have just handled virulent pus are soon cleaned by it, and the mechanical value of saline must be considerable. It is at this stage that the recently introduced Bunyan-Stannard silk envelopes offer hopes for irrigating and preparing the granulating bed without introducing further infection.

[1] *Guy's Hosp. Gaz.*, June, 1940.

DUTIES OF THE WORKS MEDICAL OFFICER

The Factory Department of the Ministry of Labour and National Service has issued a brief memorandum on medical supervision in factories.[1] It sets out under nine headings the principal duties of a works medical officer. They cover much the same ground as the fifteen paragraphs in the resolution on this subject passed by the Annual Representative Meeting at Belfast in 1937, the year of the passing of the Factories Act. The duties of the officer as set out are briefly as follows: to be responsible for the organization and supervision of first-aid services in the treatment of injury and sickness; to examine medically and advise persons referred to him by the management or individual employees who consult him; to assure himself of the fitness or otherwise of persons returning to work after illness; to advise the management on general hygiene in the factory; to co-operate on all matters affecting the health of the workpeople; to maintain an effective liaison with outside health services, including the medical practitioner services; to keep records of sickness and absenteeism; to promote the health education of the workpeople, and to assist in the A.R.P. services.

On one ethical point the memorandum seems to be as explicit as the British Medical Association resolution, which declared that the industrial medical officer should render such emergency or first-aid treatment as was required at the place of employment and should inform the worker's own doctor of any treatment given, and that where further treatment was deemed necessary the worker should be instructed to consult his own practitioner. The memorandum states that the works medical officer would not undertake any treatment at the home, and would only give continued treatment at the works with the acquiescence of the patient's insurance practitioner. It is also laid down that the medical officer should give to the medical attendant or to the hospital to which the workman is sent full particulars of any treatment which has been afforded, and it is added: "It is essential, therefore, that the medical officer should be in close touch, not only with the medical practitioners of the neighbourhood, but also with the local health services, so that he can keep himself informed of the patient's progress." On the question of fitness for return to work the need for co-operation is again stressed. The private practitioner cannot be expected to have a close knowledge of the particular work which each of his patients is called upon to undertake, with the consequence that he may be unwilling to allow his patient to return to work when such return would be beneficial, or may pass him as fit when in fact he is not fit for his particular job. The works medical officer can correct these errors, and with close contact between him and the private practitioner it should be easy to ensure a most helpful working arrangement.

On the subject of examination of workers it is suggested that in addition to the requirement of examination at stated intervals of persons employed in processes involving special health hazards it might well be that certain happenings, such as a large labour turnover or a fall in production occurring in a group of workers, would indicate the desirability of a periodical examination of the group to determine whether their physical condition was at fault, and, if so, in what way it was related to the circumstances of their employment. The need for works medical officers to make themselves acquainted with all the processes in the factory is emphasized—no easy thing in view of the complications of modern industrial

[1] *Memorandum on Medical Supervision in Factories.* London: H.M. Stationery Office. (2d. net.)

technique. Medical records will also be kept, and a form is appended to the memorandum with a view to eliciting the necessary particulars in such a manner as will enable a comparison to be made between one factory and another.

One special difficulty which faces the works medical officer, and which can only be overcome by the exercise of his personality and the choice of his method of approach, is the suspicion that he is there for the benefit of the employer. If such a view is allowed to prevail among the workpeople it is fatal to his influence and effectiveness. Everything turns upon his impartiality being above suspicion. He is there to benefit both the industry itself and the individual worker, and he can demonstrate that these two motives are by no means irreconcilable, as industrial interests are promoted by the good health of the worker, which is the works medical officer's prime concern.

Reports of Societies

WAR STRAIN: ITS MANIFESTATIONS AND TREATMENT

A meeting was held at the Tavistock Clinic at its temporary home, Westfield College, Hampstead, on November 24, to discuss "War Strain: Its Manifestations and Treatment." The meeting was so well attended that it was decided to resume the discussion on December 8. Colonel J. R. REES took the chair, and remarked that most of those working in E.M.S. units or in general practice were likely to have more to contribute to such a discussion than the groups who were actually working at the clinic, certainly more than those attending the members of the Forces.

Experiences in the East End

Dr. HENRY L. WILSON gave impressions based on his experience in the neurological department of the London Hospital, in a first-aid post in which there had been 500 patients, and in shelters in the borough of Stepney. In September, 1939, many people rushed to the department in states of acute anxiety, but after a few days, not only because bombing did not happen, but because the nervous system of the individuals became conditioned, the number of acute cardiac, respiratory, gastric, and other symptoms of a psychoneurotic kind appeared to be much less. Again, in September, 1940, there was also an immediate rise of acute peptic ulcers and of perforations in people who had old ulcers. The cases coming to the neurological department included, first, mild anxiety states which would have come up in any case, by no means all due to war strain. Then there were people who found conditions a little more dangerous or disturbed than they had expected and who broke down because of an unstable ego-ideal. These were people who were desperately anxious to keep a stiff upper lip, and were chiefly frightened of breaking down in face of their friends and neighbours, and so developed anxiety symptoms. Many of them were helped by simple persuasive talks in which it was pointed out to them that they were by no means alone in experiencing strain, and that there was nothing to be ashamed about in their worries. Among the new hysterics were a number of people who had been accustomed to obtain religious recreation at little Bethels in the neighbourhood, and when this was no longer open to them owing to the black-out were forced back on their families and developed conflicts leading to hysteria. Then there was a depressive group, people who had shown previous evidence of psychological instability and were now threatened with the loss of husbands, lovers, or children.

In the early part of this year the static war situation had something to do with returning stability, but the fall of France had its reaction in Whitechapel in the shape of many anxiety states, the symptoms again being largely referable to the stomach or thorax. Often these occurred in people who were trying desperately hard to pretend that events did not worry them or threaten their safety. With this there arose a growth of suspicion, when every second person was regarded as a member of the "fifth column," a phenomenon to be explained by the fact that suspicion was awakened by anxiety. An intensification of long-standing hysterical symptoms or the advent of new hysterical symptoms was noticed in those previously subject to recurrent hysterical palsies.

Cases at a First-aid Post

From the beginning of the intense air raiding of London in the middle of September there had been, so far as the London Hospital was concerned, five acute occasions when the first-aid post was working at its maximum. But the number of patients with hysterical and neurotic symptoms was smaller than had been expected. Some were brought in with transient paresis who, if they had been left for a longer time under debris or in a state of discomfort, would have developed hysterical paresis or loss of sensation lasting considerably longer. When the time elapsing between the onset of a palsy and admission to hospital was considerable it was much more difficult to disperse the accompanying hysterical anaesthesia than in cases which showed a certain amount of loss of sensation when brought in directly after having been bombed or hit by falling debris. He had seen only three cases of hysterical contractures, and all had responded well. He had not been able to attempt hypnosis in patients with hysterical tremor who came in as casualties after an air raid. They had been given luminal and hyoscine, had slept for from two to six hours and wakened without any tremor at all. Appointments were made for them to come back, but they never did so, and that was one of the great troubles in the general confusion—there could be no proper follow-up. He had seen no cases of hysterical amnesia or aphonia, and only four cases of acute confusion, occurring in people like auxiliary firemen who had been grossly overworked and had had no sleep. They showed all the characteristics of the "Dunkirk syndrome." At Charing Cross Hospital all cases of that kind were given 1 gramme of paraldehyde per stone of body weight, and he was told they slept for forty-eight hours.

How Old Patients "Stand Up to It"

He had tried to summarize what had happened to thirty-five patients whom he had known pretty well during the months immediately preceding the *Blitzkrieg*. Of this number, eight had either been evacuated or killed, and seven belonged to the old psychiatric "mud heap"—people who had had hysterical symptoms for many years. Four of these appeared definitely to have improved, while two who had been previously overcompensated for gross physical deformities had become much worse. Patients who had been carrying on with rather acute symptoms of anxiety for a long time past were able to stand up to conditions of bombardment better than one had ever imagined; it had been his purpose in dealing with these patients to see that they were helped with medinal or luminal to get adequate sleep. Those who had been doing useful social work outside their family or business also stood up to circumstances in a very gratifying way. One patient who had done remarkably well was a girl of 18, a mental defective suffering from anorexia nervosa, which condition had been improving ever since the air raids started. A certain number of psychological disturbances referred to the heart or chest were found among A.F.S. or A.R.P. men who went into those services at the beginning of the war because their business had disappeared, and who had never been very stable but had carried on so long as the work was easy. It was difficult on seeing a patient to determine at once whether he was good or bad "stuff." He had seen a few cases of men who looked as if they were going to break down into a long neurotic illness, but after getting them to sleep with hypnotic suggestions they had been able to carry on.

What was happening in the shelters? He had been through a St. John Ambulance shelter log book, containing 1,100 entries extending over a month, and if the question of headache were put on one side he could not find more than fifteen obvious psychological disorders out of that 1,100. In one shelter in the East End the emergency exit was blocked one night as the result of an explosion. Thirty people were dealt with, all of them slightly injured and very nervous, but again

it was shown to be true that if these cases were received quickly enough their confidence and capacity were soon restored. He hoped that some people were investigating the sociological questions of the shelter population.

Cases at a Base Hospital

Dr. H. V. DICKS said that at his base hospital no novel features not ordinarily seen in the last war were observed among the patients received. The neuroses before the present bombardment started were all of the orthodox peacetime pattern. The most common type of psychological case was the conversion hysteria—hysterics who converted their fears into one or other of many somatic symptoms. The second commonest group consisted of anxiety states, the third were simply terror cases, coupled with fatigue or the effects of blast or concussion, and the fourth consisted of cases suffering from depression. One had to differentiate strictly between cases which were immediately or perhaps solely due to an acute traumatic situation and those patients who, since bombing began, although they might not have been in the immediate vicinity of explosions, had been frightened by sirens or gun-fire and had developed acute neurosis.

In a series of twenty-seven cases of so-called civilian casualties as classified by the E.M.S., the distribution as between the sexes was eleven females and sixteen males, the ages varied from 17 to 61, and the occupations from professional men to domestics and labourers. The most interesting thing was the relation of past history and disposition, including family history and heredity, to the severity of the trauma. Out of the twenty-seven cases fourteen showed a positive past history to a limited degree, and a further six an exceptionally bad past history. But the other seven required a high degree of trauma or repeated trauma to break them down.

The chief officer of a cross-Channel steamer who had never had any psychological difficulty before passed through Dunkirk and rescued some badly wounded soldiers. His ship was bombed and sunk and he was the last man to leave it. He went straight to his home at Dover and had a hot bath, and after a few days' leave was appointed to another ship which was stationed close to a munition store, frequently bombed. After this new bombing he had an acute anxiety attack with vomiting and fainting. He was given a short sick leave, then pronounced normal and posted to a ship containing a store of high-explosive depth-charges. The whole crew were sitting on a powder magazine. He remained there through raid after raid, until eventually he broke down and had to leave the ship, feeling himself a dreadful coward. He went to his home, which was bombed while he was in it, and then he was about to rejoin a ship when he had another breakdown and showed symptoms both of anxiety and to some extent of conversion hysteria.

The simple terror cases were all in women who were all more or less affected by blast, and these cleared up quickly. The neurotic population in hospital, apart from civilian casualties, had shown only very slight reactions to the war. Some got the "wind up" when the sirens went, but a certain amount of air-raid noise and activity had been like a graduated dose of vaccine to these people, and had by no means been badly reacted to in many cases.

Treatment

The first means of treatment was the administration of sedatives, which were gradually withdrawn when the sense of security had been re-established. Baths and massage were also employed. A point was made of detoxicating those who needed it at the earliest possible moment. As regards psychological treatment, the rule had been made not to attempt under war conditions to deal with complicated personality neuroses in a person who had been ill for some years and in whom the war had merely aggravated the affection. All that was done was to attempt to restore the *status quo ante bellum*. Those who dealt with neurosis in the last war experienced the great value of the abreaction of fear. One method available was hypnosis in the best Freudian manner. Not all cases were easily hynotized. He preferred to give evipan sodium compounds to produce a certain hypnosis, and the stage which was utilized was that which supervened on waking from the actual evipan sleep. The patient was then mentally relaxed and would go into any emotional state that he was ordered, would see himself back in the traumatic state, would scream and let off all the repressed feelings, and recover extremely quickly. Among depressed people he found that not much material that was not already conscious could be elicited under narco-analysis, and they seemed to do best under one or other form of continuous sleep therapy, as with paraldehyde or soneryl.

Finally as to disposal of cases, a regime in a hospital not too secluded from air-raid noises seemed desirable. Here they were reassured, and their own attitude towards anxiety could be reconstructed. People with serious breakdowns, as distinct from those who recovered after a few days, should be sent into safe areas. This was generally easy in the case of such people as railway employees, who could be sent to some quiet part of the line, or in the case of domestic servants, who could find employment in reception areas. Children did very well with mild psychotherapy; enuresis was the chief difficulty.

Discussion

Very little time was available for discussion. Dr. STUNGO (St. George's Hospital) said that the number of cases among out-patients there had been relatively few, and some of the old chronic cases seemed to improve for no particular reason. He had been interested in Dr. Dicks's reference to evipan therapy. He himself had advocated an alternative technique—namely, instead of inducing anaesthesia in these cases, to keep them in the pre-anaesthetic state and conduct the inquiry during that time. Dr. MACLAY asked whether much increase in alcoholism had been noted. He had known some people who had begun to take alcohol to enable them to endure the nightly bombing. Another point was that many soldiers showed cases of amnesia or fugue. Dr. E. H. ROSENBERG mentioned some investigation on the records of about 100 cases attending the Northern Clinic. Obsessional patients appeared to be almost entirely unaffected by war strain. Of the old hysterics, about half were unaffected, and the remainder were equally divided between those who were improved and those who were adversely affected. Of the depression and anxiety cases a number had improved and a number had been made worse; there was a smaller proportion unaffected than in the other categories.

Dr. WILSON, replying to that point about alcoholism, said that a good many people who were now compelled to stay at home were drinking considerably more than they formerly did, but very little alcoholic neurosis had been seen in the wards or the out-patient department of the London since the outbreak of war. In the shelters, to which people went from 6 p.m. or earlier, great credit was due to the shelter marshals for the admirable way in which they controlled any drinking. He also added a point about the aggressiveness of people who came to the first-aid post after enduring bombing. The most useful method of dealing with their aggressive instincts was to hand them a box with an invitation to contribute to the Spitfire Fund!

URAEMIA AFTER ACCIDENTAL HAEMORRHAGE

At a meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland on October 11, the president, Dr. R. M. CORBET, reported an unusual case of accidental haemorrhage which had terminated fatally from uraemia.

The patient, aged 37, pregnant for the second time, was about thirty weeks gravid. She suddenly developed severe pain in the abdomen, back, and head; and about six hours later a light coma set in. Up to a week previously the urine had been free from albumin. When examined she was bleeding a little and had all the signs of toxic accidental haemorrhage. Complete anuria developed, and Caesarean hysterectomy was performed about thirty-six hours after the onset of the attack. The anuria was relieved thirty-six hours after operation—apparently by the intravenous drip administration

of isotonic sodium sulphate. A lumbar puncture at this time showed blood in the cerebrospinal fluid. The patient improved for a week, but the blood urea showed steady and persistent rise, and she died in coma seventeen days after the original onset. At necropsy the kidneys appeared large and pale, with considerable fibrosis and advanced degeneration, though the glomeruli were mostly normal.

Dr. J. F. CUNNINGHAM emphasized the importance of guarded prognosis in accidental haemorrhage. Caesarean section should not be performed unless the condition was grave, with anuria, in which case the risks must be taken. The most important thing was to watch the blood urea. The principal danger was the toxaemia, which might kill the patient even if she recovered from the bleeding. Dr. O'DONEL BROWNE asked why the operation had been subtotal instead of classical. Dr. G. C. DOCKERAY thought that the kidney was in a condition of chronic fibrosis rather than cortical necrosis. He referred to a somewhat similar case he had seen in which decapsulation of the kidney had been tried without success. Dr. T. M. HEALY believed that uterine haemorrhage was seldom fatal and was only one manifestation of the toxaemia which killed the patient.

Dr. A. H. DAVIDSON (Master of the Rotunda) had seen two or three rather similar cases. He thought that the toxaemia was due in most cases to ischaemia of the kidney produced by narrowing of blood vessels. He advocated Caesarean section if accidental haemorrhage did not respond at once to ordinary treatment; the operation was not performed often enough.

The PRESIDENT, in reply, said that he had done subtotal hysterectomy for the sake of speed and to remove any possible uterine source of toxin. He wished he had operated earlier, but had not felt justified at the time. At operation he had palpated the kidneys, but they had not suggested tension. The terminal coma had certainly been uraemic, but the earlier condition had been peculiar, and probably due to the blood in the cerebrospinal fluid.

Rubin's Test

Dr. T. M. HEALY reported the results of 600 Rubin's tests, using Bonney's apparatus under ether anaesthesia. There had been no ill effects. In a smaller series he had used carbon dioxide under nitrous-oxide-oxygen anaesthesia; three physically normal patients with patent tubes had died with symptoms of damage to the cerebral cortex—two on the table and one thirty hours later. He had found that the pressure of carbon dioxide averaged 10 mm. higher than that required when air or oxygen was used.

Dr. BETHEL SOLOMONS said that it seemed almost impossible to decide the cause of death. The presence of lipiodol in the sinuses after injection suggested some form of embolism. It seemed that carbon dioxide was a direct irritant. Dr. F. W. DOYLE mentioned a somewhat similar case recently in his care. The patient was given spinal anaesthesia, after morphine and hyoscine, and investigated for sterility; the tubes were absolutely blocked. She was then curetted. Suddenly she complained of great pain, became cyanosed, collapsed, and died. He had used a cylinder of oxygen and the pressure had gone up to 200 mm. Dr. J. F. CUNNINGHAM preferred to do Rubin's test without an anaesthetic; the most important factor was the technique. Great care must be taken not to injure the cervix. He used a very fine catheter, which only penetrated the uterus for about one and three-quarter inches, and stopped at once if there was bleeding. Dr. O'DONEL BROWNE quoted several hundred cases with only one fatality—a streptococcal peritonitis. He thought the test could be done in the out-patient department without anaesthetic or premedication. He did not use a bullet forceps, passed as little gas as possible, and allowed the pressure to rise to at least 250 mm. Dr. G. C. DOCKERAY said that the literature gave Rubin's test and artificial pneumothorax as the two chief causes of air embolism. Dr. B. SHAW thought that shock might cause death. Any kind of premedication with a spinal anaesthetic was risky. Dr. EDWARD SOLOMONS said that vaginal air insufflation produced air embolism.

The MASTER OF THE ROTUNDA said that in the last fifteen years he had done about 1,000 cases; in 400 he had curetted and then tested again, and had found that in 60% the tubes which had previously been blocked were clear after the operation. He found it very hard to believe in air embolism after Rubin's test. He always went up to 250 mm. pressure, and used gas-and-oxygen anaesthesia. Dr. E. A. KEELAN said that his only concern hitherto had been to ensure that the cork of the cannula was not too mobile; if much pressure were used to keep the cork against the external os it was possible to perforate the uterus with the cannula. The PRESIDENT said that he used carbon dioxide up to a pressure of 200 mm. under full ether anaesthesia. It seemed difficult to dissociate the fatalities from the use of carbon dioxide under nitrous oxide and oxygen; air embolism could hardly account for those patients who survived the initial collapse, and in two cases there was a possibility of shock associated with imperfect anaesthesia.

Dr. HEALY, in reply, questioned whether Rubin's tests were worth the trouble involved. He thought that carbon dioxide was an irritant to the tubes.

TREATMENT OF BURNS

At a meeting of the Shaftesbury Military Hospital Medical Society on November 5, with Major-General F. CASEMENT in the chair, a discussion took place on the treatment of burns.

Brigadier P. H. MITCHINER said that treatment must be carried out promptly if lives were to be saved. Deaths were due to shock, sepsis, and delayed shock, but despite the views of Professor Wilson of Edinburgh he did not believe delayed shock was a great danger; perhaps tannic acid was used in weaker solutions south of the border. Transfusions were not usually practicable in the first-aid treatment of immediate shock, but where practicable they should, of course, be given. Simple and effective treatment consisted in keeping the patient warm, giving him morphine, and resting him for half an hour rather than moving him immediately. The most important advance in the prevention of sepsis was the introduction of the sulphonamides; all cases should have sulphanilamide by the mouth from the beginning. For local treatment of the burnt area the patient should be thoroughly anaesthetized—morphine in large doses was satisfactory and preferable to the inhalants, as the lungs were usually already irritated by smoke—the burnt area and the surrounding skin for a good six inches should be well cleaned, the blebs removed, and a coagulating solution applied. He preferred 2% tannic acid, but 1% gentian violet was probably as good. It had recently been stated that tannic acid was liable to produce contractures of the fingers, but there was no reason to suppose that the contractures which had been observed were other than the natural result of deep burns of the fingers. If sepsis occurred the eschar should be removed at once and the area retanned. If skin grafting was considered necessary it could be done much earlier than was often advised.

Major J. O'DONOVAN said he had found that where there were a large number of deaths from burns, as in factory explosions, particularly T.N.T. factories, much medico-legal work was involved in establishing identity from charred remains and in establishing that death was due to the burns and not to some other—and sometimes criminal—cause. He described burns seen in the Army service from a celluloid comb set alight by a hairdresser's drying-hood, and an ultra-violet light "burn" from a lamp used for photographic purposes. In the latter case the skin had been sensitized by antecedent rich feeding and mixed American cosmetics. He also described two cases of dermatitis artefacta in soldiers: one a repeatedly blistered buttock caused by sitting on a hot-water pipe, the other a burnt forearm brought about by tying on halfpennies dipped in muriatic acid. This latter case he treated by enveloping the opposite hand in a heavy casing of plaster-of-Paris.

Dr. JANET VAUGHAN, discussing the use of transfusions, said in many instances of burns in air-raid casualties she had been able to reach the victims in one to two hours, so that transfusion was a practicable first-aid measure. When the transfusion unit was not called for twelve to twenty-four hours the cases did badly. The only air-raid casualties which showed haemoconcentration, as judged by estimation of haemoglobin, were those in which there were burns, except for a few rare

cases of traumatic oedema. Blood was better than saline, but not so good as plasma. She advised giving plasma for twenty-four hours only; after that time even plasma might cause oedema. Further, plasma contained a small amount of merthiolate, which was added in an attempt to reduce likelihood of infection during preparation, and it was presumably not advisable to give more mercury than necessary to cases already liable to renal damage. After twenty-four hours concentrated serum should be given. After seventy-two hours it was unnecessary to give further transfusions if the case was properly tanned, but so long as the area was oozing transfusion should continue. If there was only one vein left available a cannula should be tied in; this had the double advantage that the amount of fluid given could be better controlled, and glucose could be administered continuously, which, according to Professor Wilson, might prevent delayed shock, since it was certainly associated with hepatic degeneration. If the patient was infected whole blood was indicated. Summarizing the treatment of burns, Dr. Vaughan said that blood transfusion should be started immediately, should be persisted in, and sulphonamides should be given before infection had begun.

Correspondence

Infection in the Shelters

SIR,—As you say in your leading article in the *Journal* of November 2 (p. 598), the rules for lessening the spread of droplet and air-borne infection are well known. It is essential that administrative measures will be based on these fundamentals. I would agree that evacuation of cases of tuberculosis in an active state would assist in preventing the spread of the disease among children and adolescents.

Four or five years ago at the Annual Conference of the National Association for the Prevention of Tuberculosis, the late Dr. Burrell stated that 85% of the adult population (urban) were infected with the tubercle bacillus. This statement was accepted by the Conference. This fact, it appears to me, is overlooked. I consider that our administrative measures, now and in the future, should be guided by this fact and its implications. Eighty-five per cent. of the adults using public shelters are already infected with the tubercle bacillus. The work of the community is being done by infected members who have established an effective internal control of the bacillus—that is, whose resistance is good.

Our administrative measures will, therefore, fall into two categories—those to control the spread of infection and those to control the conditions within the shelters that would lower resistance. (1) Reduce the child population in public shelters by persuading parents to accept evacuation under the Government scheme. (2) Encourage sick and invalid members of the community to accept evacuation. (3) Organize shelters on the following lines. Three classes of shelters might be arranged.

Class No. 1.—(*a*) So long as the evacuation of children is voluntary, allocate certain shelters or certain sections of tunnel or other underground shelters for use only of children. (*b*) Exclude from these shelters any individuals suffering from any form of chronic chest disease—bronchitis and bronchiectasis as well as tuberculosis. (*c*) Tickets of admission or passes for the use of children's shelters will be granted to adults who produce a certificate of freedom from chronic chest disease.

Class No. 2.—Shelter for persons aged 14 to 18 years, arranged as above.

Class No. 3.—Reserve for adults over 18 years. No medical examination necessary. Children and adolescents excluded.

The medical officer of health would have power to examine any ticket holder and to exclude him, if necessary in his opinion, from the shelter.

Something may be done to control and utilize the fear of infection in tubes and shelters. For example, fear of infection would be raised by the near presence of someone sneezing, coughing, spitting, or blowing the nose. This fear may be enhanced (in the tube tunnels in regular use) by the presence of certain advertisements that emphasize the fact of infection and seek to allay the fear by the use of some proprietary product. Such advertisements should be removed, and in these tunnels and also public shelters there should be simple, brief statements of facts—the part that germs play in disease and the need for caution and control. The fear of infection should be allayed by establishing confidence and trust in the administrative measures taken to prevent the spread of disease and in the power of the body to control it. Statements on posters should encourage confidence and trust, not in any particular proprietary product but in the way of healthy living. Details of the right diet could be given, emphasizing the importance of milk, green vegetables and salads, fat, wholemeal bread, etc.

To sum up, the problem of infection in the shelters will be solved by measures to control the spread of infection and measures to control the conditions that affect the resistance of the body, and these should be part and parcel of a national campaign for health and fitness.—I am, etc.,

P. A. GALPIN,
West Ham, London, E.13. Tuberculosis Officer.

SIR,—The fear of epidemics in air-raid shelters is creating a demand for constant medical attendance at the shelters. Little thought has been given to the means which the doctor will employ to check infection, apart from the use of such prophylactic measures as large-scale immunization, antiseptic sprays (is there a spray which would prevent droplet infection?), and gauze masks (would people wear them?). The problem with which I, as a shelter doctor, am confronted is the detection of disease in the prodromal and acutely infectious stage. This problem cannot have arisen before on such a large scale, and unless some solution can be found it will be almost impossible to check an epidemic. If it were practicable it would be interesting to find out whether nightly records of pulse and temperature are helpful in discovering early infection.

Early diagnosis must largely depend on the co-operation of the patients, as symptoms—for example, sore throat, malaise—usually precede signs. By means of talks and lectures a doctor or nurse could explain the possible significance of various apparently trivial ailments, and appeal to shelterers in their own interests to present themselves for medical examination should they develop these suspicious symptoms. If, on examination, there was any suspicion of infectious disease it would be necessary to isolate the patient for a short time until recovery ensued, or a diagnosis, sufficiently accurate to justify admission to hospital, could be made.

It becomes obvious that the second necessity for combating infection is an isolation area in the shelter. Unless it is in the shelter, fear of a journey through dark streets and falling bombs will lessen or exclude the co-operation of the shelterers in detecting early illness. At present there is no space available in most shelters for isolation accommodation. Unless this can be provided very soon we shall be faced with an impossible task, as the doctor will have his hands tied in the treatment of all but the fully developed case, which can at once be sent to hospital. He will thus occupy the position of a placebo, whereby people are made to feel that everything possible has been provided for them, although, in effect, the doctor's presence can make little difference to the outcome of the epidemic.—I am, etc.,

London, E.1, Nov. 16. JOAN V. LAUGHLIN.

Air-raid Problems

SIR,—Dr. E. B. Grogono's letter (November 9, p. 643) well merited its place at the head of the correspondence columns, and I hope that we shall be able to read many more equally good accounts of A.R.P. first-line work. May I make the following comments on the points raised?

1. There can be no doubt of the value of morphine given to the trapped victim; and if unhappily he dies before the rescue party can release him, at least his end will have been a less painful one. I carry in a small haversack a supply of the *B.P.* hypodermic injection solution of morphine in a rubber-capped bottle, and a hypodermic syringe with needle mounted ready for action in a spirit-proof case. My haversack also contains coramine, anaesthetic mask, and ether, barley-sugar sweets to give to trapped victims, and such

simple instruments as artery forceps, tourniquet, etc. A tube and funnel is sometimes helpful to give drinks to a victim trapped in a deep hole under debris.

2. There is usually little of the textbook variety of first aid to do at an "incident," but first-aid parties can do very valuable work if they work in close co-operation with the rescue parties, from whom they should take over as soon as the victim is freed from the wreckage, and is ready for the delicate operation of lifting him out of the hole. Rescue parties tend to do this themselves, and, skilled though they are at their own job, they do this too roughly in many cases.

3. The number of casualties per bomb is certainly amazingly small, and in this district one sees very few non-fatal casualties due to bomb splinters: most are injuries due to collapse of buildings. One of the difficulties that I have found on arriving at an incident is that wardens ask for more ambulances and first-aid parties than are really needed, so that one of the jobs of the doctor at an incident is to weigh up the situation and see that only the vehicles and men actually needed are kept on the spot, while the others are sent back to their posts to be available if needed at other incidents. In any case one tries to keep in touch with the Central Control Room through the nearest telephone, and it does not take long to call up an extra ambulance if one is needed; but an unemployed ambulance is better "on call" at its post than standing idle in a street.

4. The crowd at an incident is often a great nuisance, and much depends on the competence of the police or other incident officer, who should not only keep the crowd away but should see that the various services present are working together systematically: "too many cooks" and too many "bosses" lead only to muddle and confusion.

5. The doctor can do most useful work, not only with his morphine but also, in a big incident, in sorting cases and sending as many as possible of the lightly injured and shocked patients back to the first-aid posts, and so making it easier for the hospital to deal with the more serious cases.

We have now had experience of intensive night raids in this town "somewhere in the Midlands," and have found that a "mobile doctor" going out to an incident from the first-aid post under the direction of "Central Control" on a bicycle or in one of the "post" cars can do much useful work—and is perhaps more useful in a medium-sized town with good hospital facilities than a more elaborate mobile surgical unit.

One last word of advice to the doctor who goes out on such expeditions—put on a boiler-suit overall and gum-boots before you go!—I am, etc.,

Coventry, Nov. 14. NORMAN GREGG.

Immunized Persons as Diphtheria Carriers

SIR,—One of the few beneficial effects of the war from the air is the widespread public interest in the possibilities of protection against infectious diseases. Immunization, if encouraged by the medical profession and carried out on a large scale, will produce a sharp decline in the incidence of some of the most fatal of these conditions, which may well outlast the period of hostilities by many years. Most patients seek the advice of their medical attendants before taking a decision on this issue, and for that reason it would be unfortunate if Dr. E. Brauer's suggestion (November 16, p. 683) that a person immunized against diphtheria may be a danger to the community were allowed to pass unchallenged.

The evidence on which he bases the assumption that two of his patients were carriers while the third was immune against diphtheria is quite inadequate. The result of one swab is insufficient to support either of these assertions, the first of which can be accepted only after repeated swabbing, followed by bacteriological proof of virulence, and the second only if the Schick test is negative. As a matter of fact, the immunity following diphtheria is relatively short-lived, as shown by the occasional relapses in convalescent patients, and by the fairly common occurrence of a second attack within a year or two after the first.

Assuming, for the sake of argument, that a few immunized children do become virulent carriers, should that consideration be allowed to weigh against the undoubted fact that immunization prevents a clinically recognizable infection in the vast majority of cases and considerably lessens its severity in the remaining few? A glance at the figures published by the public health authorities in Canada and in the U.S.A. is sufficient to justify this statement. The only alternative is to let children run the risk of infection, with all its attendant dangers and without even the satisfaction of knowing that they are less likely to become carriers afterwards, or that they will be immune against a second, perhaps more severe, attack.

Surely, the answer to the problem of diphtheria prophylaxis is more immunization. If we take advantage of the present popular interest in this question and succeed in protecting a large section of the community, the existence of virulent carriers would become a matter of purely academic interest.—We are, etc.,

D. F. JOHNSTONE.
P. FORGACS.

City Isolation Hospital, Plymouth, Nov. 18.

SIR,—Dr. E. Brauer (November 16, p. 683) considers that his experience in connexion with a case of diphtheria "will be of general interest to every practitioner in this country." I am in full agreement with this statement, but far from its detracting from the value of immunization it is surely one of the most striking arguments in favour of more intensive and widespread diphtheria prophylaxis. Had the two children who were subsequently found to be diphtheria carriers not been immunized, it is probable that instead of only one case of diphtheria arising in the household three cases would have required diphtheria antitoxin and removal to the isolation hospital. Surely it is a very retrograde step in the realms of preventive medicine for criticism to be levelled against parents who wisely take steps to protect their children from the risk of serious ill-health and perhaps death from a preventable disease. The development of a disease due to ignorance or neglect on the part of one group of parents to avail themselves of the facilities provided for its prevention should not hinder another group of enlightened and far-seeing parents from taking action which may save their children's lives.

The degree of danger to a community from carriers depends upon the number of susceptible persons in that community. It is surely better to reduce the number of such susceptible persons by individual prophylaxis rather than by allowing many of them to develop active immunity by an actual attack of the disease with all its grave complications.—I am, etc.,

C. W. ANDERSON,
Nov. 18. Assistant Medical Officer of Health, Cardiff.

SIR,—Dr. E. Brauer (November 16, p. 683) draws attention to the possibility of immunized persons acting as carriers of diphtheria. This possibility is well known to the medical officers of closed communities like schools and institutions, where immunization is, or should be, universal. We have in this institution and our school nearly 2,000 patients, and we commenced Schick-testing and immunization in 1926. I cannot speak too highly of it. Whereas before 1926 we had outbreaks of diphtheria every few months, now the problem has ceased to exist. Though, possibly, we may be a slight danger to the outside public, it does not matter in the least to us how many carriers we have inside. Our only difficulty is to prevent new medical officers removing patients to the isolation hospital as soon as the laboratory reports diphtheroids in a case of ordinary tonsillitis.

The remedy, surely, is for the general practitioner to follow the example of those of us who are more fortunately placed, and insist on the wisdom of immunizing all children against diphtheria. Then carriers will be of no importance.—I am, etc.,

F. DOUGLAS TURNER,
Nov. 19. Medical Superintendent, Royal Institution, Colchester.

SIR,—I read with interest the letter of Dr. E. Brauer (November 16, p. 683). It is theoretically possible that diphtheria immunization may increase the carrier rate, but whether this actually occurs is another matter. A small increase would be a small price to pay for an immunized population. It could have some beneficial effect, as small latent infections, especially in urban areas, help to maintain the herd immunity. The letter does not help to elucidate whether active immuniza-

tion may increase the carrier rate, as it does not mention if the cases were Schick-tested or the results of the swabs checked by virulence tests.

It is important to realize when discussing carriers that normally about 1% to 5% of the child population are carriers, and just before an outbreak of diphtheria the percentage may rise to 15% or 20%. A large number of those who harbour the organism temporarily are no danger to others, but are developing their own immunity. Some immunized children relapse to the Schick-positive state within a few years. Most competent authorities will agree that active immunization against diphtheria can control it. In times like the present the Government should make it compulsory.—I am, etc.,

Gorseinon, Swansea, Nov. 22. G. E. DONOVAN.

Realism in First-aid Instruction

SIR,—It was particularly interesting to read Mr. D. G. Duff's letter (November 9, p. 647) on the use of plaster-of-Paris wound models for this purpose. A similar method has been used in Manchester. I was able to borrow the models for a group outside the city, and it was obvious that they stimulated the workers to put into practice the best they knew. It was not merely a case of an "exercise," but here were almost real casualties to be treated.

The difference in these models, which were made by Mr. Franklin Charlesworth while he was senior instructor of the part-time personnel of the F.A.P. in Manchester, was that they were constructed in papier mâché. Plaster-of-Paris models break too easily. Papier mâché does not break if dropped, is light and semi-flexible, and when painted with lacquer paint is not affected by rain and can be used out of doors. It is made from old newspapers and flour paste, and the models are baked in any oven. The total cost of materials for a large city is a few shillings. Added realism is gained by having old clothes suitably torn and "blood-stained" for the "casualty" to wear.

The only unfortunate aspect is that no one has been found willing to volunteer to make a large enough number of models to allow of distribution to every post. If this letter produces volunteers I shall be only too happy to put them in touch with Mr. Charlesworth, who will gladly show them how to make the models, which have only to be seen to be appreciated as something of inestimable value.—I am, etc.,

Manchester, Nov. 16. W. SAYLE CREER.

Psychiatric Casualties

SIR,—I cannot help feeling that Dr. Ellis Stungo is possibly a little rash in drawing such definite conclusions in his letter (November 9, p. 645) from his own and Dr. George Pegge's experience, and I note that Dr. Pegge himself wisely refrains from so doing. It is extraordinarily difficult at the present time to attach any significance to statistics derived from the London area. A very large proportion of the population has been evacuated from some districts. On the other hand, a number of hospitals and observation units have been damaged so that patients from their area serve to swell the figures at other centres.

A major difficulty in psychiatric casualties is, as Dr. Pegge stresses, the question of accurate diagnosis. The bulk of patients who are admitted to the observation unit in an acute confusional state are quite unable to give an accurate account of themselves. In such cases one must rely on the evidence of the relatives, who may themselves have been killed, injured, or evacuated. Thus, in quite a number of instances it is impossible to obtain a reliable history, so that Dr. Pegge's question, "Would the patient be in his present position were it not for air raids?" must remain unanswered.

The observation unit to which I am attached has during the past two months admitted far more cases than usual, and of these a considerable proportion have been classed as air-raid casualties. As explained above, the number of these would probably be increased if full information were available, though a few doubtful ones would probably be excluded. These cases range from simple exhaustion to an agitated confusional state resembling mania. The clinical material differs considerably from that described by Dr. Pegge, largely because almost all the cases are admitted via the relieving officers and the police. By far the biggest proportion are composed of old men and women previously quite normal and capable of managing their affairs, who are plunged into a state of agitated confusion by the destruction of or damage to their homes and the desperate attempt to adjust themselves in their old age to a rapidly changing and apparently chaotic environment. Not a few of these old people have died shortly after admission from exhaustion or broncho-pneumonia. I have seen more cases of the more usual syndromes such as anxiety states, hysterical paralyses, and hysterical pseudo-amnesia in members of the Forces than in the civilian population, and one is tempted to conclude that this is due to the long periods of enforced idleness which, in the present state of affairs, bulk so largely in the life of these men.

In any event it is in my opinion most important that the problem of psychiatric casualties should not be underestimated. It is a very considerable one, especially if one makes allowance for the large number of cases which remain unrecognized and untreated (unless one describes as treatment an assurance by their private doctor that there is "nothing wrong" with them), and it is almost certainly of the same magnitude as the question of the prevention and treatment of physical injuries. It may be added that effective air-raid protection, as by the provision of Haldane type shelters, would undoubtedly cut down the incidence of mental as well as physical casualties. Real protection gives that feeling of security which is essential to the abolition of the anxiety state. The stout concrete walls of the Haldane shelter would cut out most of the noise, and the additional space would, if properly utilized, permit comfortable sleep. This would largely eliminate the factor of exhaustion, which is so important, especially in old people. Use of effective communal shelters of this type would also prevent that syndrome which has been aptly designated "Anderson depression."—I am, etc.,

St. Mary Cray, Kent, Nov. 15. B. H. KIRMAN.

Treatment of Pneumonia

SIR,—The leading article on the treatment of pneumonia (November 9, p. 633) raises many interesting points. I should like to add some observations from one of the centres in this country where a combination of sulphapyridine and specific serum is being used.

At the outset, however, may I voice one criticism. In most British reviews of American results the writer as a rule at some point questions "how far these conclusions are applicable to pneumonia as seen in this country." This evasive attitude is probably due to the lack, still deplorably frequent, of routine serological typing, so that there can be no strict comparison of British and American figures. Most workers in this country select for study cases showing the classical clinical picture of lobar pneumonia as enshrined in our older textbooks; and, although it is not yet possible to be dogmatic on the point, I suspect that a large proportion of cases with this canonical picture are Type I infections. It is, of course, known that infections of this type never had a high mortality and they have been found to respond well to chemotherapy. A selection, therefore, which includes a large number of Type I infections would make the results of chemotherapy appear unduly good and produce a dangerous optimism about the pneumonia problem as a whole.

So far as I know, no fatality rates (F.R.) for the different types have been published in this country other than my own results in 217 cases[1]; to these may now be added cases from the other two Glasgow fever hospitals, bringing the total number of typed cases treated with sulphapyridine to 501.

Type I		Type II		Type III	
Cases	F.R. %	Cases	F.R. %	Cases	F.R. %
128	3.9	294	11.6	79	33

These figures do not afford a strong basis for the statement that sulphapyridine is an "outstanding triumph."

The combination of serum and sulphapyridine has already given us promising results and agrees with the recent work of

[1] Anderson, T., and Cairns, J. G., *Lancet*, 1940, **2**, 449.

Finland and others in America[2]; the need for further study of this complementary treatment is obvious from the fatality rates in the table, especially where, as in Glasgow, there is a high incidence of the more serious Type II infections. In general, chemotherapy alone is adequate for Type I cases, but in Types II and III (the only others thus far adequately studied) there is a strong argument for serum in addition when the patient is over 40 years or when the blood culture is positive. The clinical improvement seen after the use of the combined method of treatment is a convincing proof that it is based on a biologically sound principle.

I am indebted to the superintendents of Belvidere and Knightswood Fever Hospitals for permission to publish the above figures.—I am, etc.,

THOMAS ANDERSON,
Deputy Physician Superintendent.

Ruchill Fever Hospital, Glasgow, Nov. 21.

Fear and Disease

SIR,—Casting out fear is surely one of the most important services our profession can render to suffering humanity. My own twenty years of general practice furnished abundant evidence that a doctor's work consists far more in removing the groundless or exaggerated fears of patients or their relatives than one realized at first. Since taking up ophthalmic practice twenty-six years ago increasing experience in this branch of our profession has taught the same lesson. Patients often say nothing of their secret fears, and in the pressure of work one is apt to overlook the fact that such fears are present.

Take the common cases of presbyopia. A patient over 40 finds his near vision failing; and though he hopes (as he says) that it is only "anno domini," he often has the secret dread that it may be cataract beginning or some other disease of the eye liable to lead to blindness. It is well in these ordinary cases of presbyopia, after satisfying ourselves of the absence of disease, to assure the patient that there is no sign of cataract or other disease of the eye. It is surprising how often such an assurance evokes the answer, "Oh, I am so glad; that was what I was afraid of"—although the patient has been quite silent regarding these fears. Similarly, in cases of miners' nystagmus there is only too often a secret fear of blindness developing as a result of that disease. Such a fear is, of course, quite groundless. But the fact that it is very commonly present was brought home to me at a meeting of the Northern Counties Association for the Blind years ago, when it was seriously proposed that miners' nystagmus should be added to their schedule of causes of blindness. More recently, in examining recruits found to have defective vision in one or both eyes, experience has proved that a secret fear of the presence of some disease of the eyes exists far more generally than is realized. A man discovers that his vision in one or both eyes is not up to standard, but requires the help of glasses. He is apt to reason that there must be some disease of the eye present, and that such disease may get worse or affect the other eye as he grows older. In nearly all these cases there is no disease of the eye at all; merely an error of refraction, with more or less amblyopia superadded in some cases due to marked inequality of refraction or to former strabismus.

In all these cases I now make a practice of assuring these men that the eyeball is perfectly sound and healthy, so that they can rid their minds of any fear that they have any disease liable to get worse or to affect the better eye and cause blindness later on. A simple demonstration with a lens of three-inch focus that it will give a clear picture of my illuminated test types only when a screen is held just three inches from the lens is useful. It helps to make clear the point that the "focus" of the eye depends, roughly speaking, on the size and shape of the eyeball; and that the eyeball may be one-hundredth of an inch too long, or too short, from front to back, and yet its contents be perfectly sound and healthy. The keen interest shown by these patients in such an explanation and their gratitude for such a reassurance fully bear out the impression that these fears of which they have said nothing are real. Again and again one hears such remarks as—"You have taken a load off my mind"; "I am so glad you have told me that: that was what I was afraid of."—I am, etc.,

Sheffield, Nov. 19. HERBERT CAIGER.

[2] Finland, M., Lowell, F. C., and Spring, W. C., jun., *New Engl. J. Med.*, 1940, 222, 739.

A Plea for Action

SIR,—In 1920 and 1921, in Poland, I was responsible for the inspection of the prisoners-of-war camps in which the Denikin and Koltchak prisoners were interned, and for similar inspections for part of the Polish army camps. The aim of the work was to arrange distribution of stores allotted to the Services from various relief organizations in the country to assist in maintaining sanitary conditions. Poland was at that time passing through the sixth year of war conditions and facing concentrations of men and women on her soil for which she was quite unprepared. She has always been a country far poorer in resources than countries further to the West.

In spite of this, conditions now obtaining in parts of the bombed London areas are worse than those which I had then to inspect. I cannot speak for the Provinces, but I hear from reliable observers that the same can be said of certain situations there. One aspect particularly alters the position in that here children are involved, and unprotected adolescent girls. Not only is this true, but owing to the breakdown of administrative machinery and the lack of executant powers of superadded functionaries there is no immediate prospect of the real difficulties being remedied. There is an essential reason why this should be so, and abuse will not make it better. The reason, however, is an important reason, and closely connected with the whole question of England in and after the war.

There is in the British people, the Navy always excepted, a total inability to devise machinery which will deal with material catastrophes in a manner which realizes the elements of the situation and adjusts itself to them adequately and "elastically." What is attempted is to patch the existing machinery and add to it new features which co-ordinate, or are designed to co-ordinate, with larger bodies at fresh angles. The result is the addition to already overworked officials of masses of new responsibilities which they have not the time, or in some cases the training, to undertake; and the appointment of consultant and advisory officials of a higher order in no way alleviates the situation. Paper recommendations, however sound, are useless without the necessary organs of executive action.

Nor is this the whole difficulty. There remains the vastly important one of motive power. Desperate conditions need determined, and in some cases desperate, action. English social administration is constructed to interpose buffers all through its network of interacting bodies for the express purpose of preventing precipitate action, and therefore maintaining social stability. This system has served us well in preventing a stampede in one or other direction of feeling or opinion, such as has been the destruction of the Continent. What we have to realize, however, is that a system cannot at one and the same time achieve two opposite goals: here, that of social stability, and of swift, determined, well-planned, and co-ordinated action. It is a *reductio ad absurdum*, and the longer we take to realize it the greater will be the accumulation of disaster that there is to clear up.

So far the suggestion has been that if the one system does not meet the needs of the moment it should be scrapped for the other; but this is to sacrifice the greater for the less. That potential gangsters should be growing up in the greater cities, and children lying nightly in freezing cold excreta, is bad, but to scrap the whole system of social stability to deal with a temporary hell is worse, and productive of worse hells in the future. There is an alternative, and the curious thing is that it is an alternative which has always been clearly perceived by the people of this land when the disasters were occurring in other countries, but which has not yet struck us as needed in our own. Emergency situations need emergency action. This action we have supplied all over the world. There has not been a famine, an epidemic, a war, a national disaster, from Armenia to Japan, which has not had its units of devoted Englishmen setting out to deal with it. Here is the right motive and a drive deep enough to bear the inevit-

able suffering. Disasters, like the results of war on civilians, I submit, cannot be met by Borough action; old petty jealousies supervene, old habits and the cross-cutting of private vested interests. In Poland, as in Russia and China, the worst of the suffering was met by foreign units, men and women devoted to just this thing: anxious and untiring in co-operation with authorities, local and central, but determined to get the job done whether they were permitted or not.

Is it not here that medicine should give a lead? Boroughs and Ministries will not save South and East London. By their nature they cannot do so. The task is too large, too motley, and too composite. It needs qualities that are not developed in peacetime officials, and a determination that is missionary and not complacent. What is needed is that London should be regarded as Armenia or, if you like, Poland after the Peace of Riga. War is not peace and cannot be met by the social construction of peacetime energies. A dual initiative is needed: the initiative that contests the war and the initiative that repairs the enemies' ravages. To this, later on, is needed the army of re-creation; but for the present to stop the leaks that widen every day is the first urgency. This second army must be voluntary, determined, passionate; it must refuse to take "No" for an answer, and refuse to stop till the job is done. In Poland, in China, in Armenia were Governments, sometimes helpful, sometimes obstructive. In all, the barriers of unfamiliarity, of language, of ignorance of custom, had to be faced, and the many books of histories of that time show what nevertheless was accomplished. The same is true here. There are authorities, some helpful, some frankly obstructive, some just dead and sunk in officialdom. Tact covers most gulfs, and where tact will not do determination will. We need a new discovery of individual initiative and a new determination. Democracy, if it is to survive, must have two elements in its national life: the element of stability represented by our normal social system of government, and the element of creative unexpectancy represented by the individual initiative of our own people, who refuse to let their elected officials tell them that things cannot be done, or to smooth away desperate human misery by pretentious words.

To clear South and East London, to make good the ravages of the Yellow River, to prevent typhus in Denikin and Koltchak concentration camps, an army was and is needed—a determined army of private citizens organized under any one of the great banners of compassion that have been characteristic of Britain and the admiration of the rest of the world; but an army which is prepared to die if need be—to die of overwork, of a broken heart, of ordinary exhaustion—as certain of the members of those older armies died, before they will give up their task.

In Poland two men from the Lake Country led us; in the East often a doctor has done so. Cannot this be again?—I am, etc.,

London, W.1, Nov. 5. MARGARET LOWENFELD.

Lateral Radiographs of the Chest

SIR,—I have read with some apprehension the article on the above subject by Drs. Stefan Engel and G. Gregory Kayne (November 9, p. 619).

I see from time to time unfortunate individuals, both adults and children, diagnosed as tuberculous on purely radiological evidence where the reading of the film has been faulty. From the article in question it would appear that the diagnosis of enlarged glands can be made frequently and with certainty from lateral views of the chest when they cannot be seen in the antero-posterior view. As a radiologist with some years of clinical experience in diseases of the chest I fear that this view, if accepted, may greatly increase the number of children wrongly diagnosed as suffering from tuberculosis. There is the risk that they will be sent to mix with open cases of pulmonary tuberculosis in sanatoria.

Thanks to the work of Assmann, Sukiennikow, Engel, and Nelson, we have been familiar for some years with the general arrangement of the lymphatic glands in the thorax. The use and importance of the lateral view in chest radiography has also been taught for many years at the Brompton Hospital and, I am sure, at the other chest hospitals. It is essential, however, to remember that we are viewing a photograph of shadows, and that it is very easy to draw conclusions from these shadows which are unjustified. Dubious conclusions are particularly liable to be made if from some preconceived idea we expect or wish to find an opacity in any given area. Engel and Kayne admit that in lateral views both sides of the chest are projected on to the same plane, but they add, "The side nearest the film plays, however, a predominant part in the formation of the resultant picture." Moreover, in one of their diagrams (Fig. 7) they have pictured the *x*-ray beam as composed of parallel rays, instead of, as is the case, emanating from a point source. The manifest falsity of the above quotation arises from this misconception, for, as a direct consequence of the divergence of the rays, the further away from the film an object is the greater is the distortion and the larger the shadow it casts upon the film. This can be well seen in the lateral film taken after a bilateral bronchogram. In such a film it is often impossible to say definitely on which side any given bronchus is, though from the fact that it appears larger than usual one may suspect that it is on the side furthest from the film.

Any opacity appearing in the areas to which Engel and Kayne have drawn attention may be, and in a majority of cases probably is, due to a fortuitous arrangement of overlapping shadows. That they tacitly admit this is shown by the fact that in several of their diagrams glands are illustrated as overlapping the heart and great vessels. As a consequence of the superimposition of opacities near the hilum in a lateral film the greatest caution is essential in the interpretation of the observed appearances. When due allowance is made for the width of a chest such an overlap of shadows may occur in a variety of ways. I agree with the authors that the radiographs must be technically satisfactory, and I also agree that if they were technically perfect it might in some cases be possible to differentiate between a gland showing definite enlargement and such an aggregate of superimposed shadows. Unfortunately, to obtain a technically perfect lateral film is extremely difficult and, without high-powered apparatus, is quite impossible. Apart from the minor difficulty of always obtaining the true lateral position, the glands they mention are in the majority of cases so near the great vessels that there is much transmitted pulsation. Technically, to obtain a picture of a gland in this situation sufficiently clearly cut to be of value for its identification would require a film taken at full distance to minimize distortion, and would demand an exposure of the order of a thirtieth to a fortieth of a second to overcome movement.

I do not deny that if the glands are grossly enlarged they can be seen in the lateral view, but in my experience they can then usually be seen more easily and with far more certainty in the antero-posterior position. To label as glands the smaller and relatively poorer defined opacities because they happen to overlie certain areas in the lateral film cannot fail to lead to misdiagnosis. It is far sounder to search for a parenchymatous lesion or pleural involvement as a help to diagnosis in childhood tuberculosis, and it should be remembered that more harm may be done by labelling as tuberculous a case which is in fact free from infection than by occasionally overlooking the primary infection.—I am, etc.,

London, W.1, Nov. 15. L. G. BLAIR.

SIR,—Dr. Blair has kindly forwarded us a copy of a letter sent to you for publication. He criticizes our paper (November 9, p. 619) at length, but his letter is full of misunderstanding. As regards the general tenor of our paper we need only refer to the first paragraph of "Discussion" to show how much we ourselves appreciate the difficulties of interpretation of lateral radiographs. Indeed this was the reason for undertaking the elaborate topographical investigation.

(1) Fig. 7 is correct, because in a diagram rays may be considered parallel when the radiograph is taken, as is usual, at a distance of six feet. (2) The extract "The side nearest the film plays, however, a predominant part in the formation of the resultant picture" is also correct, "predominant" being of course used in the sense of "the stronger or main element" (*Concise Oxford Dictionary*). (3) The difference between the two sides does not matter very much when dealing with bronchial glands, since the latter are situated in the

middle of the chest. It is quite a different matter when dealing with bronchograms which involve the lateral parts of the chest. (4) Shadows due to overlapping are ordinary occurrences; to discriminate them from true glandular shadows is part of the routine job of anyone who undertakes to interpret radiographs. The purpose of our paper was to assist workers to avoid misinterpretations. (5) To quote Dr. Blair: "To label as glands the smaller and relatively poorer defined opacities . . ."—this is an arbitrary supposition which cannot be gathered from our paper; the contrary is the case.—We are, etc.,

S. ENGEL.
Nov. 23. G. GREGORY KAYNE.

Closed Plaster Technique for Infected Fractures and War Wounds

SIR,—I share the enthusiasm of Mr. G. R. Girdlestone and Prof. H. J. Seddon (November 16, p. 687) for Trueta's most excellent work in advocating the "closed plaster" technique, in overcoming indifference and opposition, and in publishing a series of magnificent results. I join in their appreciation of his valuable contribution to the surgery of war. This appreciation is very general throughout the country, but whereas we are giving Trueta full credit for his advocacy of the Winnett-Orr method, we are lamentably failing to give Winnett Orr any credit at all.

I am seldom impressed by discussions as to the exact authorship of this or that technique, because so many advances are the result of the conscious or unconscious collaboration of a number of scientific workers. But when a fully developed technique has been advocated by one surgeon for no less than twenty years, and after that long interval it is ascribed to another surgeon who recently employed it, the injustice makes me a little indignant, and none the less indignant because the second surgeon may be entirely blameless. Ever since the war of 1914–18 Winnett Orr has been advocating the technique which is now in general use. He developed it in the treatment of war casualties and compound fractures, and not simply osteomyelitis as suggested in one of Trueta's articles. He came to this country in the spring of 1930 and demonstrated the method on our own compound fractures. It was published in our own journals, including the *British Journal of Surgery*, ten years ago. Even at that time the method was already applied to the injuries of warfare; the details were already worked out, and the scope and limitations were already defined. Why should we now describe it by any title other than that of the Winnett-Orr technique?

Mr. Girdlestone and Prof. Seddon suggest that the method has been carried "far beyond the place claimed for it by its originator," but this is at once disproved by the literature of the last ten years. Winnett Orr and many of his disciples have persistently claimed exactly that which is now being achieved. Moreover, a trial of the minor modifications suggested by Trueta, such as the use of a plain gauze pack instead of one of vaseline, the omission of vaseline protection of the skin, and the application of the method (to the total exclusion of skin suture) even during the first few hours after injury, satisfy me that no improvement or "development" of the technique has yet been described. The one real advance of practical value is the control of smell by the deodorizing bag designed by Prof. Seddon himself.—I am, etc.,

Liverpool, Nov. 17. R. WATSON-JONES.

SIR,—May I supplement Mr. R. Watson-Jones's letter (November 9, p. 648)? Several years before the Spanish War this technique was combined with application of cod-liver oil. Cod-liver oil treatment of slow-healing wounds was used about 1922 at the Royal Free Hospital with success.[1] At a surgical congress at Magdeburg in 1932 Professor Wilhelm Löhr reported on the value of crude cod-liver oil in the healing of wounds. Later Löhr published his work on the subject.[2,3] The pure oil dries rapidly, so that it must be combined with some inert substance. Löhr's ointment formed with secretion an anti-bacterial cover of emulsion. Massive suppuration occurred; soon the dead tissue was shed. An impenetrable layer of plaster was applied as soon as could safely be managed, but not to highly infected wounds until the infection had been overcome. The almost sterile wounds of industry can safely be immobilized in that way at once, and, in the resulting warm chamber, heal at amazing speed. The bandage may likewise be applied at once to any part in which the circulation is deficient, as in chronic ulcers of the leg, and to chronic wounds, even if infected.

Löhr[4,5] has claimed remarkable success for the following treatment in acute osteomyelitis. The operation field was made bloodless, a long incision made over the tender part of the bone, the periosteum split, the pus evacuated, the wound, including all its corners, filled with cod-liver oil ointment instead of rubber drains and tampons, the skin incision loosely closed with interrupted sutures so that pus could escape readily, and a circular plaster cast applied. A profuse discharge of pus emulsified with oil occurred in the next few days. The behaviour of the wound was shown by temperature, tongue, appetite, and sleep. Though, in case of excessive secretion from the wound, the cast might be removed earlier, it was most often removed at the end of the second or the third week, when the wound was usually more or less healed. If, six to eight weeks after the onset of the disease, sequestrotomy (followed by refilling with the oil) should be necessary, it was to be done radically. In chronic osteomyelitis the cavity resulting from removal of the affected bone was often enormous.

Löhr treated with this method second- and third-degree burns, reducing late fatalities from secondary infection more than with tannic acid. Abundant secretions in the first few days might call for a new cast, but usually the cast was kept on for two weeks. Limbs with third-degree burns were enfolded in sterile towels thickly covered with the ointment. A cast might be applied after a few days, especially if contractures of the joint were feared. During three and a half years at the Alstadt Hospital no burnt surface was sown with transplants, even though the epithelium had been destroyed over a surface as large as the back. Löhr observed the epithelization of a third-degree burn 45 cm. square. In five years he treated about 300 cases of burns in hospital and nearly 1,000 ambulatory cases.[5] Of twenty-one patients treated for bacteriologically confirmed gas oedema in his hospital none died, and only one needed amputation.

During the war in Spain this form of treatment became customary for any severe wound inflicted on an arm or a leg by shrapnel or by a splinter from a bomb.[6] Such splinters as could be found were extracted and the wound was then packed. Cod-liver oil or soft paraffin was used as packing. Next the wound was rapidly sealed up in a plaster bandage, for which wire splints were used. The date of its infliction, with a summary drawing or description of the particulars observed by the surgeon who had dressed it, was pencilled on the plaster. Thenceforth the patient could move about and did not need attention for, sometimes, weeks. The pus that was expelled, through the development of pressure in the wound, dripped off or was wiped away. The process gave remarkable results. Most calamitously, however, French surgeons later treating refugees from Spain, but evidently unfamiliar with the method and presumably misinterpreting the resultant disagreeable odour, amputated limbs that were undergoing the process.—I am, etc.,

London, N.10, Nov. 13. J. E. J. PALSER.

REFERENCES

1 Heald, C. B., *Lancet*, 1936, **231**, 946.
2 Löhr, W., *Chirurg.*, 1934, **6**, 263; *Dtsch. med. Wschr.*, 1934, **60**, 561; *Zbl. Chir.*, 1934, **61**, 1686.
3 —— and Treusch, K., Ibid., 1934, **61**, 1807.
4 —— *Arch. klin. Chir.*, 1934, **180**, 206.
5 —— *Dtsch. med. Wschr.*, 1936, **62**, 997.
6 *Times*, February 24, 1939. Special correspondent at Perpignan.

Convulsive Cardiazol Therapy in Cardiovascular Disorders

SIR,—Dr. Rankine Good's interesting observations on cardiazol in cardiac cases (November 9, p. 624) lack authority because his analysis does not seem to be based on any clear application of the principles of cardiac pathology. Dr. Good's own work has shown that the cardiac damage, permanent or temporary, wrought by cardiazol falls on the myocardium. Hence it is in those cases where there is evidence of myocardial insufficiency that we should expect

especial risk from the use of cardiazol. Such evidence in any particular case is provided by the presence of failure either of congestive or anginal type, or, in the absence of these severe signs, by diminished exercise tolerance. In certain cases also typical cardiographic changes may be observed. Now in only one of Dr. Good's cases was, apparently, electrocardiography carried out, while in only one (Case 3) is there any hint of the exercise tolerance. Still more important, this latter omission makes it impossible for him to tell us whether the exercise tolerance improved or deteriorated after the exhibition of cardiazol; and surely this should be the focal point of the whole investigation.

Dr. Good admits that he had the temerity to use cardiazol in Case 3, which showed frank failure of anginal type, while he was "restrained in only one case—a heart case in which compensation was poorly established." In a scientific investigation of this type the ill-founded conception of "compensation" would be better replaced by a simple scientific statement of exercise tolerance and the presence or absence of failure. Case 3 is actually of peculiar interest because the exercise tolerance appears to have greatly increased as a result of cardiazol therapy, and recently Bourne and Wittkower showed that "in true angina of effort, relief of underlying anxiety by psychological treatment results in improvement or loss of cardiac pain." It would be of interest to know the nature of the mental symptoms in this case.

Such important observations as those recorded deserve the benefit of precise analysis, and it cannot seriously be maintained that "weak heart sounds" or even thickened radial arteries are, by themselves, satisfactory evidence of myocardial defect. Dr. Good comes perilously near to assessing his cardiac cases, as Lewis has said, "on a count of murmurs."—I am, etc.,

G. H. H. BENHAM.

County Mental Hospital, Prestwich, Nov. 15.

Aetiology of Influenza

SIR,—I have been much interested in reading Prof. Major Greenwood's epidemiological reflections on the air war (November 16, p. 677). It would be of real value if someone qualified to do so, perhaps the author himself, could summarize clearly the evidence that influenza is an infectious disease transmitted by droplet infection or by direct contact. I am not attempting to deny that this is so, but so far as I can find the evidence is mostly indirect and would permit of alternative explanations, whereas the facts of its distribution are very difficult to explain in such a manner. The recovery of virus and the transmission of a disease to ferrets, and from ferrets to mice, was interesting but indirect and by no means conclusive evidence. The virus is irrecoverable from many epidemics of influenza and inconsistent in type, and it is quite uncertain that the disease in the ferret represents the human disease.

There is the evidence of the popular opinion that influenza is a contagious disease, but while this is admissible as a link in a chain of evidence it has often proved very fallacious, since this has been the opinion in regard to such diseases as ergotism, which have not subsequently proved to be infectious diseases. The direct infectiousness of influenza is so generally assumed that it would be salutary to have a review of the evidence before too many schemes are devised to prevent the spreading of this disease, and too many conclusions are drawn about its nature.

An alternative possibility which suggests itself is that the causal agent of influenza lives symbiotically in many human beings like a primrose in a hedge, and that certain seasons favour its development to such an extent that it becomes a nuisance and a parasite, and that still more favourable seasons allow it to "flower" still more abundantly, just as certain wild flowers have "years." It will be seen that the difference of concept is considerable. Although influenza should be considered as infectious in that the agent may spread from one human being to another, the epidemic is explained not so much by this factor as by the sudden lighting up to parasitic activity of a quiet commensal already living in the body. The extraordinary explosiveness of influenza pandemics would thus be no more surprising than the speed with which the woods become carpeted with bluebell flowers. All this is very hypothetical, and there are other possible hypotheses. The only excuse for mentioning this one is to suggest that the present conception of the transmissibility of influenza is also a hypothesis not yet adequately based on sufficient evidence.

(An example of the type of disease which I have been attempting to describe is given by certain types of helminth infestation in animals. In these a mild degree of infestation is so constant as to be considered normal, and the host and the invader are so mutually adapted that normally no symptoms result, but occasionally outside circumstances upset the balance and allow of much severer infestation with the worm, whereupon the animal becomes ill and may even die. This state of affairs probably also exists in the human in the Tropics in certain types of hookworm infestation.)—I am, etc.,

Beaminster, Dorset, Nov. 19. R. E. HOPE SIMPSON.

Cut Fingers in Factory Workers

SIR,—In reply to my friends Messrs. W. R. D. Mitchell and H. Blacow Yates (November 16, p. 685), there is nothing novel in the method of flexor tendon repair. Two No. 60 linen thread sutures carried on a No. 18 half-circle needle are inserted about a quarter of an inch from the ends. Two more are used for fine adjustment as near the end as is compatible with an efficient hold. They are tied second. The wound in the skin, enlarged as required by vertical incision avoiding the midline, is closed by end-on mattress sutures. A dorsal plaster slab applied to the forearm and flexed fingers remains for three weeks.

I am grateful for their endorsement of my concern over the increasing incidence of cut flexor tendons and the risk of permanent loss of use; but they question if even prompt suture is as successful as it is easy. I admit their stricture is valid, and that even early suture is not always the final triumph that my words implied. This should engage the earnest attention of orthopaedic leaders. Meantime our immediate duty is to ensure that the lesion does not go totally neglected for days and weeks, as so often happens now.—I am, etc.,

Bristol, Nov. 20. A. WILFRID ADAMS.

Application of a Thomas Splint

SIR,—The following detail in the application of a Thomas splint may be found useful to the many these days giving instruction to first-aid units. Number 2 assistant in applying extension to the leg grasps the heel by the inner hand—that is, left hand for a left leg—and the front of the ankle by the outer hand. Number 1 assistant slips on the ring along the foot, Number 2 removing the upper (outer) hand. As the limbs of the splint are swung to the horizontal to pass the ring round the heel, Number 2 grasps the heel by the outer hand on the near side of the ring and removes the inner hand. As soon as the ring passes up the leg the inner hand resumes its grasp, but now in the upper position over the ankle. The change over of hands in this way allows the manipulation to be carried out in the smoothest manner and without fumbling. The replacement of the heel grip maintains the extension without variation in tension, so liable to occur when the heel grip is relaxed and the upper grip (often too far forward on the foot) takes all the strain.

The details were worked out by the members of the mobile unit.—I am, etc.,

Nov. 15. G. L. DUNCAN.

Mass Radiography

SIR,—The question of miniature chest radiography is most interesting. As a radiologist I have the feeling that we may be tackling this problem from the wrong angle. Miniature photography of the fluorescent screen image cannot to-day produce results at all technically comparable with radiography using the full-size film. Shortage of raw materials or lack of labour can be the only rational reasons for adopting inferior techniques, unless, possibly, one is influenced by certain convenience of developing and storing the tiny negative. Why not investigate the present high cost of *x*-ray film? Surely ample supplies of cheap film would entirely wipe out any of these roundabout methods of achieving less perfect results. There are many conditions in the chest for which we should search as well as for tuberculosis, and the majority of these

require radiographs of high technical quality. Frankly, unless it is a question of shortage of raw materials I entirely fail to see why we as a profession should tolerate anything but the very best for our patients. They certainly would not allow it if we used our positions of influence to enable public opinion to control governing policy.

The next step after mass chest radiography is likely to be bulk radiographic investigation of the gastro-intestinal tract. I believe that schemes could be perfected whereby very large numbers of patients could be investigated with full co-operation between radiologist and other members of the professional team. Mass radiography of the intestinal tract would seem almost certainly to call for highly protected screening units, and the expenditure of some ten to twelve small films and one or two larger films per patient. The basic cost of such investigations would be infinitesimal in comparison with the savings effected in industry and war production even with films at their present price, but I feel that such price is artificially high.—I am, etc.,

Belfast, Nov. 15. DOUGLAS BOYD.

Euthanasia

SIR,—The conclusion arrived at by many well-known members of our profession is that the act of dying is usually not in any way so terrible to the dying individual himself as it seems to his friends present at the death-bed. In my *Aspects of Death* (London, fourth edition, 1922, p. 514) I referred to the prevailing medical evidence in support of this conclusion, quoting the opinions of such eminent men as Sir Henry Halford, Sir Benjamin Brodie, Sir William Gull, Sir W. S. Savory, Dr. William Munk, Sir William Osler, Sir J. F. Goodhart, Prof. H. Nothnagel, Prof. C. A. Ewald, and I would now add Sir Frederick Treves, Prof. A. E. Hoche, Prof. G. Perthes, and Prof. J. A. Ryle (1940). Dr. T. Bodley Scott (1914) went so far as to write: "The so-called agony of death is, in my experience, a chimera."

Nevertheless, although the act of dying is usually not so terrible to the dying individual as is still commonly supposed, there are occasional cases of extremely painful chronic incurable disease in which the patient longs for artificial release from almost intolerable suffering. For such exceptional cases I would join myself to those who wish to see the law altered, so that, with properly considered limitations, at the patient's repeated earnest request, if more than one experienced doctor certified the case as incurable and the pain and distress as almost unbearable, painless death might be administered. I regard Nature as one of the manifestations of God, and believe that we human beings have been gradually permitted to acquire more and more control of Nature—of which we ourselves constitute a part. We have been enabled to avoid much suffering and death by aseptic surgery, anaesthetics, anodynes, chemotherapeutic means, etc. Why should we not in exceptional cases of chronic painful incurable disease relieve the patient of his life at his repeated earnest request? One often hears Nature blamed for cruelty, which we ourselves—a part of Nature—might nowadays, and possibly are intended to, prevent.—I am, etc.,

London, W.1, Nov. 18. F. PARKES WEBER.

Pathogenesis of Non-pulmonary Tuberculosis

SIR,—A reading of the article on the pathogenesis of non-pulmonary tuberculosis by Dr. M. C. Wilkinson (November 16, p. 660) shows that the author has considered a large and valuable material, but the discussion and conclusions seem subject to criticism.

Most workers would agree that in the presence of haematogenous tuberculosis involvement of glands may not always be obvious, though a primary complex with a glandular component seems to be a necessary precursor of such lesions. Further, it is well known that an active primary complex may give rise to rapid dissemination—for example, such a complex is often found in patients dying of tuberculous meningitis, in whom also other non-pulmonary lesions may be present.

Infection of a group of lymphatic glands is evidence that there is some effort to resist the wider spread of disease. If this were not so all those who develop the primary complex would be likely soon to show manifest pulmonary or non-pulmonary tuberculosis. Nevertheless, a quite definite proportion of those who have shown a glandular involvement in the primary complex do later develop other tuberculous lesions.

In claiming that "patients suffering from gross tuberculous adenitis do not under favourable conditions develop tuberculosis in other parts of the body," Dr. Wilkinson revives an old heresy, promulgated by Marfan in 1886 but repeatedly refuted by the later improvement of diagnosis by radiography. One of us (B. C. T.) published recently an exhaustive study of 324 cases of tuberculous adenitis (*Tubercle*, April and May, 1940, pp. 217, 260) to which Dr. Wilkinson makes no reference. Apart from numerous cases of skeletal, skin, and organ tuberculosis, pulmonary tuberculosis of adult type developed in fifty-four patients with fourteen deaths, and further cases with an increased mortality are expected as time goes on.

Dr. Wilkinson surveyed 110 patients with tuberculous cervical adenitis and forty with tuberculosis of abdominal glands. Reports were received of eighty-one "at periods varying from a few months to seven years after discharge." Since no fresh lesions had developed elsewhere, it was concluded that patients treated for glandular tuberculosis do not develop fresh tuberculous lesions. This conclusion is not justified from a follow-up of only 51% of the patients and for the periods stated (how many were followed for the full seven years?). Even seven years is a short period in tuberculosis. Any follow-up of children is statistically valueless unless it is carried through to adult life, since phthisis rarely occurs before adolescence.

In view of the importance of continued and thorough observation of patients with gross glandular tuberculosis, we feel that it is desirable to correct any false impression arising from Dr. Wilkinson's conclusions.—We are, etc.,

F. A. H. SIMMONDS.
BRIAN C. THOMPSON.

County Sanatorium, Barnet, Nov. 21.

Universities and Colleges

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

THIRD M.B., B.S.—*Old Regulations:* [1] W. H. H. Merivale, *Revised Regulations:* [1] Ruth E. M. Bowden, [1 3 4] Frances V. Gardner, [1 4] Florence R. Pillman, [1 3] N. S. Slater, [1 6] A. G. Spencer, [1 2 3 4] R. E. O. Williams. *Old Regulations:* Laura M. Bates, A. D. Bell, P. W. Clarkson, D. Coueslant, O. P. Dinnick, D. M. Douglas, M. M. Ernst, K. W. G. G. Heathfield, Margaret J. Honeywill, E. G. Hosking, G. Levy, J. C. H. Maidment, S. Meleck, N. P. Orchard, M. F. Pilcher, H. I. H. Porcher, A. G. Stephenson, L. H. Turner, C. K. Warwick, J. Wills, D. A. Barley, G. A. Beck, J. C. Bryce, F. B. Cockett, Leonora A. Crawford, Muriel Crouch, T. H. Cullen, W. Darby, Jean L. Edwards, Mary E. Eiloart, G. R. Evans, J. Freeman, R. C. Fuller, O. C. Fung, Margaret E. Harker, C. A. Holman, R. E. B. Hudson, J. I. P. James, A. O. John, Elspeth M. Kaye, Joyce A. Keeping, Gwendoline M. E. Keevil, H. A. Kreiser, D. R. Livingston, Kathleen B. McClintock, M. McFarlane, Christina M. McKillivray, B. U. Meyer, Margaret Middleton, Phyllis Morley, A. O. A. Ohannessian, Ruth P. Peterson, Mary L. Rae, K. O. Rawlings, T. H. E. Richards, E. A. Ritchie, E. Rosenbaum, B. C. Rowlands, C. A. Royde, Mary M. E. Rutter, R. A. Sandison, A. C. J. Saudek, D. W. Shields, Daisy M. Smith, Margaret C. Smith, J. H. Smitham, G. S. C. Sowry, Irene J. Stark, Kathleen Staynes, M. Steel, D. V. Stott, P. V. Suckling, P. H. Sutton, Margaret L. Taylor, Beatrice M. Thompson, H. A. Warbrick-Smith, J. A. E. Watts, R. Wigglesworth, Mary U. Wilkin, D. W. Williams, S. Witt, B. W. Wood. *Group I under Old Regulations:* P. H. Beales, G. D. Daruvala, J. W. Nicholas, W. H. Weston, J. R. D. Williams. *Group II under Old Regulations:* H. N. Rees. *Part I under Revised Regulations:* K. J. Adams, J. P. Adlam, S. S. Alexander, A. J. C. Allen, A. W. Anderson, R. H. Andrews, M. W. Arthurton, I. C. Barne, F. D. Beddard, J. Beeston, R. C. Bell, D. H. Bennett, F. A. Binks, W. Black, A. Bogdanovitch, F. V. A. Bosc, K. T. Brown, C. Brun, E. M. Cheffins, L. Cohen, J. A. B. Cotsell, F. Darné, Helen Davidson, E. B. Dawe, J. Denfield, G. Discombe, A. G. Doughty, C. B. B. Downman, H. D. Doyle, C. E. Drew, Margaret D. D. Dudley-Brown, H. H. G. Eastcott, Christine Ecroyd, P. A. Eyre, B. J. Fowler, S. M. Frazer, P. D. Gange, M. B. H. Golden, C. J. Goodall, J. L. Greaves, Barbara J. Greenwood, E. Griffiths, E. W. Guillaume, A. W. Hagger, D. H. C. Harland, G. P. Hartigan, G. W. D. Henderson, M. Hershman, W. L. P. Hewerdine, M. Hewitt, N. Hext, J. C. Holman, Emily M. Horsfall, Janet R. Humphrey, Isabella C. F. Hungerford, N. N. Iovetz-Tereshchenko, H. M. Jamison, G. Jarratt, Elizabeth E. Johnson, H. P. Jones, H. O. Jones, H. M. Jones, H. L. Joyce, Evelyn A. Kaye, D. W. Liddell, Ursula M. Lister, Isabelle G. Little, Anne N. M. Llewhelin, D. Long, Silvia C. Lucas, W. C. Lyon, P. M. McAllen, I. P. MacL. MacDougall, T. McKeown, Margaret E. Matthews, Joan S. Millett, B. P. Moore, D. B. Morgan, J. V. Morris, S. Muntarbhorn, L. P. A. Newborne, N. C. Norman, W. O'Brien, C. B. O'Carroll,

R. H. A. Parker, Jean W. Paul, C. M. C. Potter, S. D. Purcell, P. A. B. Raffle, D. Ranger, R. V. Read, H. N. Reed, G. K. C. Rettie, R. E. Rewell, M. J. Riddell, R. B. L. Ridge, Dorthy H. Robertson, J. A. J. Sandilands, R. P. G. Sandon, R. D. W. Schofield, Isabel B. Schooling, B. A. Sellick, R. J. Stanley, D. Stern, R. J. Stout, M. G. Sutton, S. J. Sutton, P. N. Swift, G. S. Thomas, M. R. Thompson, H. R. Thomson, E. B. Thornton, St. J. M. A. Tolhurst, D. J. Trevan, G. F. W. Tripp, P. A. M. van-de-Linde, P. C. van der Westhuizen, A. Venner, J. H. E. Verdon, G. B. R. Walkey, G. G. Wallis, F. J. H. Walters, Kathleen M. Watson, G. N. Weber, R. H. Welch, S. D. V. Weller, B. W. Wells, H. W. Wheate, O. P. G. Whitfield, J. A. Williams, C. W. Wilson, A. L. Woolf; M. G. Allen (not yet completed examination). *Part II under Revised Regulations:* E. D. Arkell, D. W. Bain, Betty C. Bloxham, R. F. Braithwaite, D. R. Christie, Lorna M. M. Davies, G. S. Davis, Hilda M. Dean, N. H. Desai, A. J. Evans, A. R. Harrison, J. C. A. Innes, I. S. Jacklin, F. B. Meade, Madeleine B. Morris, L. P. A. Newborne, R. L. Norris, T. G. Paxon, D. G. Reinold, L. Rosen, Joan A. Rosmarin, N. Saunders, Ella Schwartzman, Honor M. V. Smith, Myra Sutherland, Gwendolen M. G. Thomas, G. F. W. Tripp, A. S. Watts, M. Wayne, W. J.-S. Wilson, J. A. J. Wiseman. *Part III under Revised Regulations:* F. A. Denz, Marcia K. Evans, J. C. Ford, H. M. Jamison, A. K. Jones, G. L. Lambert, L. W. C. Massey, R. G. W. Moore, T. N. Nauth-Misir, M. G. Sutton, D. H. G. Walker, Kathleen M. Watson.

[1] With honours. [2] Distinguished in pathology. [3] Distinguished in hygiene and forensic medicine. [4] Distinguished in medicine. [5] Distinguished in applied pharmacology and therapeutics. [6] Distinguished in surgery. [7] Distinguished in obstetrics and gynaecology.

The Services

HONORARY PHYSICIANS TO THE KING

Surgeon Captain W. J. Carr, C.B.E., R.A.N., Colonel D. M. McWhae, C.M.G., C.B.E., V.D., A.A.M.C., Group Captain E. A. Daley, R.A.A.F., and Colonel F. T. Bowerbank, O.B.E., N.Z.M.C., have been appointed Honorary Physicians to the King as from November 8.

HONORARY SURGEONS TO THE KING

Surgeon Captain L. Darby, C.B.E., R.A.N., Colonel R. W. Whiston-Walsh, D.S.O., V.D., A.A.M.C., Air Commodore T. E. V. Hurley, C.M.G., V.D., R.A.A.F., and Colonel K. McCormick, D.S.O., N.Z.M.C., have been appointed Honorary Surgeons to the King as from November 8.

CASUALTIES IN THE MEDICAL SERVICES

Royal Army Medical Corps

Prisoners of War

Major Christopher Rowland Alderson, R.A.M.C.
Major William Norman Stuart Donaldson, R.A.M.C.
Major George Dickinson Hadley, R.A.M.C.
Major Francis Joseph O'Meara, R.A.M.C.
Acting Major Charles Winsor Horncastle, R.A.M.C.
Acting Major George Geoffrey Evanson Smyth, R.A.M.C.
Acting Major Geoffrey Carter Steel, R.A.M.C.
Acting Major Alan William Woolley, R.A.M.C.
Captain Norman Altham, R.A.M.C.
Captain William Lumsden, R.A.M.C.
Captain (War Substantive) Robert Robertson, R.A.M.C.
Lieut. Michael Anthony Egan, R.A.M.C.
Lieut Edward Macrae Fraser, R.A.M.C.
Lieut. Charles Walter Iliffe, R.A.M.C.
Lieut. John Andrew James, R.A.M.C.
Lieut. Evan William Macmillan, R.A.M.C.

Wounded and Prisoner of War

Lieut. Geoffrey Harold Darke, R.A.M.C.

Previously reported Missing, now reported Not Missing

Captain (War Substantive) Colin Kenneth McCoan, R.A.M.C.

DEATHS IN THE SERVICES

Colonel Clement Henry Bensley, C.I.E., K.H.P., Bengal Medical Service (ret.), died at Southsea on November 13, aged 70. He was born at Rajshahai, Bengal, on September 27, 1870, the son of Assistant Surgeon, afterwards Surgeon Major, E. C. Bensley, I.M.S. He received his medical education at St. Mary's Hospital, and took the M.R.C.S., L.R.C.P. in 1893. Entering the I.M.S. as surgeon lieutenant in 1895, he became lieutenant-colonel after twenty years' service, colonel in 1923, and retired in 1927. He was appointed to the Jail Department in the Punjab in 1901; transferred to the Central Provinces in 1909; became Inspector-General of Jails, Central Provinces, in 1917; and Inspector-General of Civil Hospitals in Assam in 1923. In 1924 he was appointed Honorary Physician to the King, and received the C.I.E. in 1925. He served in the campaign on the North-West Frontier of India in 1897-8. He leaves a widow and two daughters.

Obituary

A. T. TILL, M.B., D.P.H.

We regret to record the death through enemy action of Dr. Albert Thomas Till, medical officer of health for the borough of Mitcham, at the early age of 40.

Dr. Till, who was born at Port Elizabeth, South Africa, received his early education in Johannesburg and his medical education at Edinburgh University, where he qualified M.B., Ch.B. in 1924. In the same year he took his Diploma in Tropical Medicine and Hygiene, and a little later went to Damascus to the Edinburgh Medical Missionary Society's hospital there. He stayed in Damascus for eighteen months, a period which saw the serious riots of the post-war occupation, and then returned to South Africa to take charge of the Mahamba Medical Mission in Swaziland. During his seven years in Swaziland he did much excellent work in the reorganization of the medical services and gave invaluable advice and guidance on the building and equipment of a new hospital. With all his activities he found time to observe the life and customs of the people, and the results of one of his studies on "Dental Caries among the Natives" was published in the *South African Medical Journal* in 1927. Ill-health due to malaria caused him to return to London, and since his interest was still in public health and hygiene he took his D.P.H. in 1931, and in that year was appointed medical officer of health for Mitcham. In the summer of 1939 he took his M.D. in public health at Edinburgh, but owing to his special duties in Mitcham in charge of the ambulance service and first-aid posts he was unable to proceed to graduation. He had worked untiringly since the outbreak of war for Mitcham's A.R.P. services and for the health and welfare of the inhabitants. He leaves a widow and young daughter, to whom much sympathy will be extended in their tragic loss.

A friend writes:

I knew Dr. Till as it is rarely given for one man to know another. We were students at the university together, sharing the same "digs" and studies throughout our medical course. His unselfish devotion, his keen sense of humour, and his great moral courage were the bases of his many friendships. Quiet and unobtrusive, with deep religious instincts, he impressed his teachers and fellow-students with the conscientiousness of his work and the sincerity of his character. During his student days he was an active worker with the Edinburgh Medical Missionary Society, on whose behalf he took over medical work in their hospital at Damascus prior to taking up medical mission work in Swaziland.

To preach the Gospel, to heal the sick, and to be a competent medical man was the avowed essence of his creed. The measure of his success he constantly questioned, not in a self-depreciatory way, but to determine if he could become more efficient or give better service. We who knew him professionally and in his private life can assess the rich quality of his life and work. Possessed of a keen observant mind, no detail, however small, escaped his notice, and his standing as a medical man and public health official was high. Truly he was a beloved physician, and many humble folks will have reason to mourn his loss. He lived life abundantly, and the memory of his character and work will long endure.

JAMES ADAM, M.A., M.D.

Dr. J. F. Lang writes: Dr. James Adam of Hamilton, before studying medicine in Glasgow, had graduated in Arts and had been specially influenced by Edward Caird. His approach to the problems set by his profession was decided by this training, and he quoted to me only a few months before his death two of Caird's dicta: "One is apt to be wrong if one claims too much"; and "One is apt to be right in what one asserts,

wrong in what one denies." His belief in the truth of these makes his work in asthma and laryngology of permanent value.

Amazing mental and physical activity, coupled with outstanding ability and keenness in his profession and a clinical memory which was impressive, combined to give him a rare knowledge of the whole field of medicine. His experience, first as a general practitioner and later as a specialist, accounted for the breadth of his outlook, and to the end of his life he kept fitting into his armoury every new discovery. His unique qualities of mind and his clinical sense gave results which are almost incredible to those who did not know him. His personality was impressive. To youth he was an inspiration; to the middle-aged a reproach. He did not tolerate fools gladly, and his treatment of the *malade imaginaire* was radical in its impact; yet he was the kindliest of men and the most sympathetic of physicians. His sense of humour was keen and his boyish zest in life remained to the end. His passing leaves a gap in many circles where the memory of his charm and kindliness will long be treasured.

Dr. THOMAS GASH, who died on November 11 at Bournemouth, was educated at Queen's College, Cork, and Dublin, qualifying M.B., B.Ch. in 1890. Almost immediately after he qualified he went to West Malling in Kent, where he speedily built up an extensive general practice, retiring in 1927. He was a member of the B.M.A. for forty-nine years. A colleague writes: During the whole of his working life Dr. Gash held to the one practice, keeping steadily at work, allowing himself no recreation or leisure time beyond the annual fortnight's holiday. Perhaps his chief interest lay in obstetrics; it is said that in the course of his many years in practice he had attended more than 2,000 confinements, and had, as he would say, "never had the misfortune to lose a mother." Until 1921, when physical tiredness compelled him to seek the assistance of a colleague, Dr. Gash had practised alone. The enormous amount of extra work and responsibility consequent upon the last war had at last begun to take its toll. During those years he had carried on the practices of several colleagues who had gone on military service, and he acted as civilian medical officer to troops stationed within the area as well as to a prisoner-of-war camp. Dr. Gash had a great capacity for work; on one morning in 1918, at the time of the influenza epidemic, he was known to start out with a list of 150 visits which he intended to do before nightfall, and on many occasions he was still seeing patients in his consulting-room at ten o'clock at night. He wielded a great influence for good in the community; in fact, the good he did is inestimable. He was essentially a man of action, one who never wasted words or time. Much sympathy will be felt for his widow, who gave him such encouragement and support in all his strenuous years of practice, and for his son and daughter.

We regret to record the death on November 7 in his ninetieth year of Mr. HENRY COLGATE, who had been in practice in Eastbourne for more than half a century. He was educated at University College School, University College, and University College Hospital, and at the Universities of London and Vienna. He qualified M.R.C.S. in 1872 and L.R.C.P. in 1873, and in the latter year he took the degrees of M.B. (with honours) and B.S. (gold medal) of the University of London and won a scholarship in forensic medicine. He proceeded M.D. in 1874 and took the F.R.C.S. in 1877. During his long connexion with Eastbourne he was successively medical officer, surgeon, and consulting surgeon to the Princess Alice Memorial Hospital. He received the Volunteer Decoration and the Territorial Decoration for his work for the Volunteer movement and attained the rank of lieutenant-colonel in the R.A.M.C., T.A. He had been a member of the British Medical Association for forty years.

The following well-known foreign medical men have recently died: Dr. WILHELM HABERLING, professor of the history of medicine at the Düsseldorf Academy, aged 70; Prof KEN KURÉ, director of the medical clinic at the Imperial University at Tokyo and author of pioneer work on neurology and metabolism; and Prof. LUIGI SESTINI, formerly director of the School of Hygiene in Naples.

Medical Notes in Parliament

The Speech from the Throne, opening the new Session of Parliament, was read by the King in person on November 21. It expressed confidence that victory was assured and stated the Government would take every possible step to sustain the health and well-being of the people in their ordeal. It promised measures for compensating those whose home or business property had at any time since the outbreak of hostilities been destroyed or damaged by enemy attack, and for extending insurance against the risk of such damage to all forms of movable property not at present protected. Further proposals for legislation would also be made to improve the conditions of those who might now or in the future require assistance from public funds.

Acts which received the Royal Assent during the Session of 1939–40 include the Mental Deficiency (Scotland) Act and the War Charities Act.

Shelters: Report of Lord Horder's Committee

Lord ADDISON inquired in the House of Lords on November 20 whether the Government was prepared to publish the report of Lord Horder's Committee on air-raid shelters, and what steps it proposed to safeguard the health of people using them. He said more lives might be lost by disease and through overcrowding and unsuitable conditions in shelters than from bombing. Toward the end of September Lord Horder made recommendations, and these had been added to, but no publicity was given to these recommendations before the morning of November 20. Perhaps the Duke of Devonshire would explain why only the recommendations had been published and not the report, which a large number of people wanted to see. The position was not satisfactory. The Ministry of Health appeared only to be able to issue circulars. This was not enough. The Department ought to have power to see that shelter accommodation was available and suitable with adequate ventilation and sanitary provision. He himself knew a big shelter where indescribably insanitary conditions had been allowed for three weeks. He heard of difficulties about the appointment of medical staff because the question had not been settled of whose panel a person was to be on. There had been feebleness of the Ministry of Health on this critical matter.

Lord HORDER said the crux of the problem had always been overcrowding. That was handled at the centre promptly. His committee felt that a great deal had been done to implement its recommendations, and much had been done by Miss Ellen Wilkinson's Shelters Policy Committee for improved security, health, and hygiene. Security and hygiene could not be separated, and dispersal was the answer to both. The risk to health was at its maximum in large public shelters, and it would be criminal to say they were within reach of the solution of the hygienic problem in shelter life. His committee in a recent minute said: "Although we are aware that some local authorities had realized the danger that confronts them and had taken steps to avert it, the impression made on the committee by its more recent observations is still profoundly disturbing." The functions of the committee were advisory, but it could not be indifferent to the causes which operated in such a way as to delay the giving of its medicine to the patients concerning whose health it had been called in for consultation. It was struck by the lack of co-ordination between the different departments of the local authorities, resulting in no one official accepting detailed responsibility for shelter conditions. Instructions were often issued to overworked officials who were unable to cope with them, their personnel being inadequate for the purpose. He trusted this matter would not be made a political controversy.

Lord JESSEL spoke of labour difficulties. Sanitary conditions in the shelters had been horrible, but when the authorities went to the labour exchanges they could not get the people to do the work. They were now able to obtain them to some extent and the disgusting conditions were being remedied speedily. The London boroughs were making provisions for additional people and were making deep shelters

in the basements of the better-built houses. Local authorities were under the regional authorities, to whose notice any defects should be brought.

GOVERNMENT STATEMENT

The DUKE OF DEVONSHIRE said there was no one report to publish. The Government was in possession of a number of reports, and Lord Horder had also verbally advised the Ministers responsible. That was the only reason why these reports had not been published, but the Government had published in a succinct form the recommendations which had been made. In the metropolitan area a series of measures had been taken, and instructions had now been issued for the application of these measures, where necessary, to the areas round London and to the Provinces. The arrangements in London aimed at evacuating those persons who could best be moved, and at dispersing the remaining population among the shelters and avoiding overcrowding. Evacuation of children from London was steadily proceeding. Arrangements had been made for old people to be transferred to hospitals under the Emergency Hospital Scheme, but many aged people objected to leaving the neighbourhoods they knew. The Government did not at present intend to take compulsory powers. Its scheme provided for regular and frequent inspection of the shelters by the medical officer of health for the borough or his assistant medical staff. This was new. The Ministry of Health could not spray the air, but instructed and urged local authorities to get ahead in this work and to engage additional staff for it when required, the cost of which would be carried by the Government. That measure was already bearing fruit.

The general scheme was supervised through a medical branch of the Ministry of Health associated with the Public Health Administrative Division. This medical branch included a team of experts on public health and on epidemics, and a special staff had been allocated to the Public Health Administrative Division. The scheme provided at the Government's expense for medical and nursing services to be available for people using the larger shelters and for medical aid posts in those shelters. Ordinarily the borough council would see a doctor was on call when wanted. In the larger shelters a visiting doctor would call nightly and be available when required. In the largest shelters there might be a resident doctor. In each large shelter there would be a nurse. The medical aid post would be a reserved apartment where people could be treated for simple ailments and injuries. Suitable instruments and medicines, which were being issued from central stores by the Ministry of Health, would be kept at these posts. Under close examination were prophylactic measures such as the possible use of a simple form of face mask to prevent droplet infection, the use of antiseptic sprays, and practical measures against infestation by body vermin. Lord Horder's Committee offered to hold itself at the disposal of the Ministers of Health and Home Security. It met frequently and was constantly consulted by the Departments. That was the answer to the question why there had been no publication of the report. Lord Horder's Committee was still doing work of great value.

Lord ADDISON asked who was to secure that effect was given to the instructions respecting the shelters. Nothing could be more serious than the minute which Lord Horder had read to the House.

The motion for publication of the report was defeated by 13 to 10.

Miss HORSBRUGH, answering Mr. Lindsay on November 20, said the full report of the Horder Committee had not been published because the Ministers for Home Security and Health decided that the enemy should not be given all the information contained in it. In addition to this initial report, the committee had made recommendations in subsequent communications, the latest of which had only reached these two Ministers at the end of the previous week. It would have been inconvenient to publish these recommendations in a series of documents. The Ministers therefore waited until it was possible to publish a comprehensive list of recommendations. There had been written reports and further verbal reports. The recommendations summed up both.

Mr. LINDSAY gave notice that he would raise this matter in the new session.

Byssinosis Bill Passed

On November 19 the House of Commons discussed the Workmen's Compensation and Benefit (Byssinosis) Bill, Mr. Peake moving the second reading. In the debate Sir FRANCIS FREMANTLE said that not one in a thousand medical men knew of byssinosis, and he certainly did not know what the word meant until he looked into the matter on the previous day. The *Lancet* recently headed an editorial article, "Card-room Asthma." He protested against the use of the word "byssinosis," which no one understood, instead of "card-room asthma," which would bring the subject home to the mind of M.P.s and the people generally. Referring to the long years of effort of those engaged in the campaign, he said it had been shown earlier that the death rate from bronchitis among male cotton strippers was five-and-a-half times as high as among all occupied males, and ten times as great as among males in such dusty occupations as cement working and lime burning. That showed that there was something specific about this complaint.

One of the most prominent workers in the investigation of this problem in recent years, under the Medical Research Council, had been Prof. Carl Prausnitz. He had had to relinquish his position as a professor in the University of Breslau, and his work on this problem was one of the advantages this country had gained from sheltering aliens well disposed to us and able to do good work. Sir Francis welcomed the Bill, but he would prefer a less strict limitation than that which provided that a man could qualify for the benefits under the Bill only after he had been twenty years in the industry. He was certain that when further knowledge was gained they would find that the seeds of the disease were sown much earlier. Prevention being better than cure, men who seemed to be affected should be taken off this work and given other work, and should receive some benefit for the injuries they had suffered. A second limitation was that the provisions as to both the compensation scheme and the benefit scheme should apply only to those totally incapacitated. He hoped, also, that the Bill would not be limited to those only a year out of employment.

Mr. PEAKE said that the reason why the Bill was limited to cases of total disability and where the employment had proceeded for not less than twenty years was that the issues were technical. The Government was following the recommendations of the Ross Committee on those two points, which involved medical technicalities.

Later in the discussion Dr. MORGAN asked for an assurance that the words "totally and permanently incapacitated for work," which medical officers would have to determine, would be used in a common-sense way as meaning incapacity for industrial work. There was a danger of their being interpreted as meaning total and permanent incapacity for exertion or work of any kind.

Mr. PEAKE said that this was a rather technical point, which had been the subject of correspondence between representatives of the workers and the Home Office. He would communicate with Dr. Morgan privately on the matter.

The Bill passed through all its stages, and on November 20 received the Royal Assent.

Diphtheria Incidence

In a reply on November 21 to Dr. Hill, Mr. MACDONALD said about 60,000 cases of diphtheria of all ages were notified annually in England and Wales. The number of children under 15 years included in this total might be estimated at 54,000. The average annual number of children under 15 who died from diphtheria was about 2,700. Hospital beds occupied at any one time by diphtheria cases might be roughly estimated at 5,000 and the annual cost of hospital treatment at £1,000,000. Experience in Canada and the United States showed the disease could be almost eliminated if the immunization of children could be secured and maintained on a sufficiently wide scale. The policy of the Ministry of Health was to encourage local authorities to provide facilities for immunization against diphtheria, and to do the best to persuade parents to take advantage of these facilities. Sir Kingsley Wood had agreed that the cost of the necessary

material should, in present war conditions, be reimbursed to local authorities by the Exchequer. Mr. MacDonald added that he was urging on local authorities the special importance of these measures in view of the free movement of children from one area to another, and in view of possible spread of infection in crowded shelters. He had informed these authorities of the concession by the Exchequer.

Vitamin B_1 in Flour.—Mr. Leach was told on November 13 by Major LLOYD GEORGE that the Government did not accept the assertion that a large number of doctors entirely opposed the decision to introduce a calcium salt and synthetic vitamin B_1 into flour. This decision was reached by the Government after receiving a recommendation from the Scientific Food Committee, of which Sir William Bragg President of the Royal Society, was chairman. Major Lloyd George said Lord Woolton could not agree to postpone action until the House of Commons had discussed the matter.

Health and Release of Interned Persons.—Mr. HERBERT MORRISON stated on November 19 that in any case in which the camp medical officer reported that release of an internee on medical grounds was a matter of urgency, release was authorized at once. There were, however, cases in which there was no immediate urgency, and account had to be taken of security considerations as well as of medical considerations. In such cases there might be some days' delay while inquiries were being made.

E.M.S. Hospitals' Executive Officers.—Mr. GROVES inquired on November 19 whether Mr. MacDonald knew that doctors attached to Emergency Medical Service hospitals complained that there were often four largely independent executive officers situated in different towns in respect of a single hospital, and that this occasioned delay and difficulty. Mr. MACDONALD said he had seen correspondence in the medical press to the effect stated. The officers referred to were not independent of one another, and their respective functions had been defined. There was no reason why delay or difficulty should occur if the instructions were properly observed, but the arrangements were kept constantly under review by his officers, who took the necessary action if difficulty arose in any particular case.

Alleged Discrimination against B.M.A. Non-members.—Mr. MACDONALD, replying to Mr. Groves on November 19, said two Local Medical War Committees, one for Lambeth and Southwark, and the other for Camberwell and Dulwich, each included two members who do not belong to the British Medical Association, out of a total membership of ten and eight respectively. He had no evidence of discrimination against non-members of the Association in selecting practitioners for appointments in connexion with air-raid precautions. Of the twenty-one members of medical boards in the Lambeth and Southwark area twelve did not belong to the Association, while in the Camberwell and Dulwich area three out of twelve were not members of the Association. Of the practitioners appointed to first-aid posts, numbering eighteen and sixteen respectively, exactly half in each case were not members of the Association. He had not been able to identify the case in which Mr. Groves asserted that a young doctor had been given several appointments to the prejudice of older doctors.

Medical News

A reminder has been sent by the Ministry of Health to medical officers of health and local authorities on the measures to be taken against food-borne diseases such as enteric fever, dysentery, food poisoning, and intestinal parasitism. Under legislation concerning milk and dairies the medical officer of health has power to see that those persons who come in contact with milk shall keep themselves and their clothing clean. Under certain public health regulations he can stop suspected carriers of typhoid fever or dysentery from continuing in employment which is connected with the preparation and handling of food and drink, and order a medical examination of that person. It is pointed out that outbreaks of the diseases of the enteric group are not uncommonly caused by persons who have not previously been suspected of being carriers. Many cases arising in this way can be avoided by certain precautions that are required by law concerning the cleanliness of, and sanitary accommodation in, premises in which food is prepared or offered for sale. Finally, attention is drawn to the need for all those persons engaged in the preparation of food or in its subsequent handling to wash their hands thoroughly on restarting work after an interval and also after every act of defaecation and urination.

A subcommittee for medicine of the now well-known national Committee to Defend America by Aiding the Allies appealed to some 140,000 doctors and 66,000 dentists to take an active part in the work of the committee by enrolling in and working for their local branch or starting a new one in their community. The response, writes Dr. E. S. Kilgore of the University of California, was very gratifying, many hundreds replying with financial help and indicating their willingness to work in their local communities and form new branches. The grounds of the appeal were that America had long been in the war in the "role of a sleeping prospective victim"; that the struggle for freedom abroad was a delaying action in their war; that the British fleet was America's present chief defence; and that the wish to keep the war out of America could best be promoted by all possible aid within the discretion of America's State and Service Departments. The members of the subcommittee included Dr. Emile Holman (Stanford University), Dr. Eugene Kilgore (University of California), Dr. Roger I. Lee (Trustee of the American Medical Association), Dr. Warfield T. Longcope (Johns Hopkins University), Dr. J. H. Musser (Tulane University), Dr. D. B. Phemister (University of Chicago), and Dr. Ray-Lyman Wilbur (Stanford University).

The London County Council announces that the out-patient department of the Maudsley Hospital, Denmark Hill, S.E.5, was reopened on November 25. Out-patients should be sent to the hospital, if possible, on reference from their usual medical attendant, and an appointment should be made beforehand. Hours of attendance at the hospital for adults will be from 9.30 a.m. to 12 noon on Mondays, Wednesdays, and Fridays (attendances will be extended to other weekdays if there is sufficient demand), and for children on Mondays at the times stated. (Telephone appointments during the hours of attendance should be made to Rodney 3841; or at other times to the Sutton Emergency Hospital, Vigilant 0054. Telephone appointments for children should be made to Mill Hill Emergency Hospital, Mill Hill 4276.) Letters should be addressed in all cases to the medical officer in charge at the Maudsley Hospital. Shelter is available if an air-raid alarm should be sounded during a session of the out-patient clinic.

A meeting of the Shaftesbury Military Hospital Medical Society will be held at the hospital on Tuesday, December 3, at 3 p.m., when the subject for discussion will be "Air-borne Infectious Diseases and their Prevention," to be opened by Major S. G. Chesney and Major F. Stuart Harris.

A joint meeting of the Society of Public Analysts with the Food Group of the Society of Chemical Industry will be held at the Chemical Society's Rooms, Burlington House, Piccadilly, W., on Wednesday, December 4, at 11 a.m., when there will be a short symposium on "Cheese: Some Recent Chemical and Physico-chemical Findings." The speakers will be Prof. H. D. Kay, Miss E. R. Hiscox, Dr. J. G. Davies, and Dr. G. W. Scott-Blair.

The council of the Harveian Society of London announces that the subject of the next Buckston Browne Prize Essay is "The Evaluation of Methods of Physical Training and the Best Scheme for General Application." The essay must be sent to the honorary treasurer of the Society at 14, Devonshire Street, London, W.1, by October 1, 1942. The prize consists of a medal and £100 and is open to all registered practitioners in the British Commonwealth of Nations.

The council of Epsom College will shortly award St. Anne's Scholarships to girls attending Church of England schools. Candidates must be fully 9 years of age, and must be orphan daughters of medical men who have been in independent practice in England and Wales for not less than five years. The value of each scholarship is dependent upon the means of the applicant and the locality and fees of the school selected. Educational grants will also be available from the Sherman Bigg Fund for children of either sex. These grants are not restricted to orphans, or to members of any religious denomination, but candidates must be of public school age and in need of such help. Forms of application for the vacant scholarships and grants can be obtained from the secretary at the secretary's office, Epsom College, Surrey.

The B.B.C. announces that the talks on first aid in air raids, the first of which was given on November 15, are to be repeated each Friday, at 10.45 a.m., until December 13. As before, the speaker will be a London surgeon.

With powers to call upon the full Red Cross and St. John war resources, a representative of the organization went to Coventry immediately after the raid, and as a result hospital supplies of all kinds, including drugs, anti-gas-gangrene serum, bandages, pyjamas, and dressing-gowns, were provided. A blood transfusion service was arranged and a number of ambulances were sent. Many casualties were taken to country houses in Warwickshire which the Red Cross had prepared as hospitals for such emergencies.

The King has approved the recommendations made by the council of the Royal Society for the award of a Royal Medal to Dr. F. H. A. Marshall, F.R.S., for his contributions to the physiology of animal reproduction. The other recipient of a Royal Medal is Prof. P. M. S. Blackett, F.R.S.

Sir William Hale-White was 83 on November 7.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

In England and Wales the incidence of whooping-cough and measles increased during the week, the former considerably, while the figures for enteric and cerebrospinal fever were slightly higher.

Whooping-cough occurred in the same number of administrative areas (fifty-four out of sixty-one) as last week; high numbers were notified in: Lancaster 332 (Blackpool 47, Liverpool 28, Manchester 22, Bolton 21, Oldham 19, Southport 16, Huyton with Roby U.D. 13); Warwick 192 (Birmingham 176, Solihull U.D. 5, Coventry 4); Stafford 186 (Wolverhampton 31, West Bromwich 1, Smethwick C.B. 27, Stoke-on-Trent 19, Walsall 15, Wednesfield U.D. 26, Sedgley U.D. 12); Middlesex 109 (Southall M.B. 36, Wembley M.B. 18, Heston and Isleworth M.B. 13, Hayes and Harlington U.D. 10, Ealing 6, Harrow 6); Yorks, West Riding, 79 (Bradford 17, Sheffield 12, Leeds 10, Batley M.B. 10, Rotherham R.D. 4); Chester 71 (Stockport 8, Chester 5, municipal boroughs of Macclesfield and Stalybridge 13 each, Altrincham 10, Sale 6); Worcester 55 (Oldbury M.B. 16, Halesowen M.B. 12, Stourbridge M.B. 10, Kidderminster M.B. 7). In Scotland notifications were received from the counties of Lanark 4 and Renfrew 1, and the burghs of Glasgow 26, Greenock 23, Aberdeen 21, Paisley 15, Dunfermline 10, Edinburgh 6, Kirkcaldy 3.

Measles is widely distributed in England and Wales, only the two small administrative areas of Isle of Wight and Soke of Peterborough escaping. It is over six times more prevalent than scarlet fever, the next in order of frequency, and there is nothing to indicate that the epidemic has reached its height. The chief centres affected are Lancaster 2,278 (Liverpool 533, Manchester 438, Salford 184, Bolton 177, Warrington 80, Leigh M.B. 112, Urmston U.D. 64, Swinton and Pendlebury M.B. 49, and 63 additional urban and rural districts); Yorks, West Riding, 2,064 (Sheffield 737, Rotherham 205, Bradford 132, Leeds 120, York 119, Conisbrough U.D. 84, Morley M.B. 80, Goole M.B. 54, Rawmarsh U.D. 47, and 52 additional urban and rural districts); Derby 910 (Derby 172, Chesterfield M.B. 213, R.D. 108, Shardlow R.D. 98, Alfreton U.D. 78); Chester 736 (Stockport 145, Birkenhead 41, Macclesfield M.B. 168, R.D. 29, Hazel Grove and Bramhall U.D. 72, Altrincham M.B. 49); Northampton 438 (Northampton C.B. 233, R.D. 53, Towcester R.D. 46, Raunds U.D. 20); Middlesex 396 (Harrow U.D. 116, Twickenham M.B. 90, Heston and Isleworth M.B. 45); Durham 388 (Sunderland 67, Consett U.D. 31, Seaham U.D. 24, Houghton-le-Spring U.D. 21, Durham M.B., and Felling U.D. 20 each); London 184 (Finsbury 28, Lambeth 24, Southwark 24, Shoreditch 16, Battersea 15, St. Marylebone 14, and in smaller numbers in 16 more metropolitan boroughs). In Scotland the chief notifications were received from the county of Lanark 13 and the burghs of Aberdeen 139, Glasgow 52, Dundee 46, Falkirk 47, Greenock and Port Glasgow 34 each, Edinburgh 33.

No. 43

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended October 26, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1940					1939 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	149	6	23	2	3	25	1	6	1	—
Deaths		1	1		—		—	—		1
Diphtheria	1,312	46	452	33	44	1,002	40	205	50	43
Deaths	38	2	8	3	2	26	1	6	2	2
Dysentery	88	2	71		—	47	3	52		—
Deaths			1	—	—			2	—	—
Encephalitis lethargica, acute	4	—	1	—	—	2	—	—	1	—
Deaths		1	—				—	1		
Enteric (typhoid and paratyphoid) fever	38	1	3	6	3	32	1	4	9	2
Deaths	2	—	1	—	—	3	—	—	—	—
Erysipelas		28	71	9	4			79	10	4
Deaths		1	1		—		—	2		1
Infective enteritis or diarrhoea under 2 years										
Deaths	34	—	14	3	2	34	2	17	7	2
Measles*	11,347	184	446		9			6		18
Deaths	12	1	3	1	—	1	—	—	—	—
Ophthalmia neonatorum	69	5	18		—	73	4	22		2
Deaths										
Pneumonia, influenzal†	655	52	13	—	7	543	36	3	1	1
Deaths (from influenza)	23	7	4	—	—	28	2	2	—	—
Pneumonia, primary			171	16				139	9	
Deaths‡		49		11	9		7		10	3
Polio-encephalitis, acute	3	—				6	—			
Deaths		—					—			
Poliomyelitis, acute	34	—	3	—	—	21	1	—	—	—
Deaths		—	—				—	—		
Puerperal fever	5	5	11	2	—	1	1	9	4	—
Deaths		1					—			
Puerperal pyrexia	133	9	18		1	137	4	29		3
Deaths										
Relapsing fever	1	—			—	—	—			—
Deaths										
Scarlet fever	1,857	56	215	65	60	1,336	19	237	61	99
Deaths	2	—	—	—	—	3	—	1	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths		—	—	—	—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough*	1,656	6	127		13			11		1
Deaths	10	—	2	—	1	3	—	—	—	—
Deaths (0-1 year)	289	23	57	14	13	274	23	66	29	13
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	5,905	1,780	570	178	125	4,639	725	681	173	139
Annual death rate (per 1,000 persons living)			11.5	11.9	10.9			13.8	11.6	12.2
Live births	5,141	519	727	347	181	5,520	637	905	373	235
Annual rate per 1,000 persons living			14.7	23.2	15.9			18.3	25.1	20.6
Stillbirths	215	13	37			238	18	39		
Rate per 1,000 total births (including stillborn)			48					41		

* Made notifiable generally on November 1, 1939.

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

‡ Since January 1, 1940, figures for London (b) have been for deaths from all forms of pneumonia; the corresponding figures for 1939 relate to deaths from lobar pneumonia only.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.) Orders for copies of the *Journal* and subscriptions should be addressed to the Secretary.

TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London;* SECRETARY, *Medisecra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Treatment of Brucella abortus Fever

"M.D." writes: I should be grateful for guidance in a case of *Br. abortus* fever. The patient has had two pyrexial periods, the second being of only seven days' duration. Is there any specific vaccine or serum which will prevent further bouts of pyrexia? Should sulphonamide be administered if another bout comes on? Alternatively, is there any more effective treatment? The patient is a healthy male otherwise, aged 47.

Longitudinal Markings on Nails

"VERITAS" inquires: What is the cause and cure of longitudinal markings on the nails, most noticeable on the nails of the thumbs, and what is the cause of the nails being highly arched, particularly marked on the nails of the ring fingers?

Treatment of Pressure Sores

"INQUIRER" writes: I should be most grateful for suggestions as to the quickest and most effective method of clearing up pressure sores on hips and back in a case of spastic paraplegia, traumatic in origin, the patient being an otherwise healthy male of 45. The following have been persevered with alternately during the past five weeks, but so far without apparent success: crude cod-liver oil, pulv. formadermine (M & B), saturated solution of sodium sulphate. The last-named, though tending to reduce the slough, leaves the skin too sodden.

Disfigurement of Nails

Dr. J. WALKER (Liverpool) writes: Referring to your correspondent "Digit's" note (November 2, p. 618), I have found great relief in cases of onychia associated with diabetes after the administration of calcium lactate in 5-grain doses thrice daily.

Purchase Tax

Retreading of Car Tyres

"M. C." asked his local garage to have two tyres retreaded; the request was made on October 9 and delivery was made on November 6. Is the claim to purchase tax correct?

*** Liability arises when the goods pass from the wholesaler (or manufacturer) to the retailer, the time of delivery being the date at which the goods were sent out from the supplier's premises. The fact that the goods were ordered before the date when the tax became chargeable (October 22) does not affect the matter. There seems to be no reason to think that the retreading was supplied to the garage before that date, and the claim would not seem to be open to refutation.

Income Tax

Temporary Residence in the United Kingdom

"A.B.C." amplifies the inquiry to which a reply was given in our issue of October 26.

*** A married man with two children in receipt of an investment income of £526 in 1939–40 would be liable to payment of £47 12s. income tax. Assuming that he came to the United Kingdom in 1939–40 and that his income was £300 in 1940–1, he would be liable to pay £7 10s.—if no income were received in that year no tax would be payable. ("Second year, ditto," in the previous reply, was intended to indicate that in the second year—as in the first—the basis of liability is the amount received in the year of assessment.)

LETTERS, NOTES, ETC.

Medical War Relief Fund

"DONOR" writes: I would like to contribute to the above fund by selling to any medical man who is a collector of coins a £2 piece of King Edward VII dated 1902. I do not know even its approximate value, and have no means of finding out without appealing to a dealer. Will anyone interested apply through the *Journal*? I would only add that the coin is in almost mint condition.

Morphine in Air Raids

Dr. W. F. BENSTED-SMITH (Devon) writes: The difficulty of giving a sterile accurate dose of morphine to patients under collapsed buildings, etc., mentioned by Dr. E. B. Grogono (November 9, p. 643) is met by the "tubunic" ampoule syringe made by Hoffman-La Roche. These are available in 1/6, 1/4, and 1/2 grain of morphine hydrochloride. They can be prepared and inserted in fifteen seconds in total darkness if necessary. They are invaluable, and I always carry them with me for emergency work—for example, motor accidents. They have but one disadvantage: they are a Swiss patent and the cost is 1s. 3d. (probably plus tax now) for each dose.

Film of First Aid in Industry

The demands made by the war on industrial output give weight and significance to the recommendations contained in the grey book entitled *First Aid in Industry*, which was published by the British Medical Association in July, 1939. Messrs. T. J. Smith and Nephew, Ltd., now inform us that they have completed a film on "The First Treatment of Industrial Injuries" which conforms closely to the recommendations of the grey book, and that they are arranging a limited number of projections of the film, free of charge, to medical staff and first-aid teams of large industrial works. The film shows first the treatment prescribed by the Home Office of minor and major injuries occurring in a small works without an ambulance room, and then proceeds to demonstrate the treatment of similar injuries in a large factory having not only an ambulance room but full-time medical and nursing staff. The design and lay-out of the ambulance room are shown, and also the daily routine treatment of old and new injuries. In a later section an accident in a coal mine is staged with the removal of the injured man to the surface and to hospital, while another section deals with first aid in a South African gold mine. Applications for a projection, giving several suitable dates, should be sent to the Medical Department, Messrs. T. J. Smith and Nephew, Ltd., Neptune Street, Hull.

Chest Signs in General Peritonitis

Dr. P. J. W. MILLS (Southampton) writes: I have observed in many cases of general peritonitis definite physical signs in the chest at the base of one or other lung. These signs have consisted of dullness to percussion, markedly diminished air entry, and crepitations. In addition there is often a raised respiration rate, pain on respiration, and some cyanosis. In cases coming to necropsy the lungs have been quite normal. I conclude, therefore, that the signs and pain on respiration are due to the inflamed peritoneum under the diaphragm preventing the diaphragm descending with respiration. There is an obvious danger that these signs may be mistaken for pulmonary complications, or the whole case misdiagnosed as lobar pneumonia. In view of these observations I feel that these signs should not influence an otherwise certain diagnosis of peritonitis or the choice of anaesthetic. I have found no reference to these signs in the textbooks, and would be interested to know if others have observed the same findings.

Cerebrospinal Fever

Dr. F. PIERCE HUDSON writes: I have had some experience in the use of sulphapyridine soluble for the treatment of cerebrospinal meningitis, and I agree with Lieut.-Colonel R. W. Cushing (October 5, p. 439) that ulcers are very prone to occur when the intramuscular injection is not sufficiently deep. In one case an inexperienced person gave an injection into the deltoid and another into the forearm muscles of a thin child; both sites sloughed. Healing of the deep necrotic ulcers which form is complete but slow, and in my experience the value of the drug for vomiting or deeply comatose patients far outweighs this avoidable danger.

Is Goat's Milk Safe?

Dr. G. BROCK (Cambridge) writes: The annotation (September 7, p. 326) is mainly concerned with the absence of infection from goat's milk in this country nowadays. I should like to direct your attention to the German literature on "goat's milk anaemia" (Schwartzer, K., *Med. Klinik*, 1938, **28**, 937). According to the opinion of most authors the goat's milk anaemia is due to the special kind of fat in the goat's milk.